

PRIMITIVE INTELLIGENCE
AND ENVIRONMENT



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PRIMITIVE
INTELLIGENCE
AND
ENVIRONMENT

BY
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PREFACE

THE field work described in this book marks a definite stage in a line of research on racial differences begun in 1922 by the staff of the Psychological Clinic of the University of Hawaii and carried on since that time. Hawaii seemed to offer unique opportunities for study of this problem because of the fact that many people of different racial groups had been brought to the islands to work as plantation laborers, and had settled down and raised children, who had been educated in the same school system and were available as subjects of comparison. These Japanese, Chinese, Filipino and Portuguese immigrants were of equivalent industrial, economic and social levels; hence it was hoped that in making psychological and other comparisons of their children the objection commonly offered to the demonstration of racial differences, namely, that the differences were nurtural and not natural, would not apply. The studies undertaken included such abilities as reaction time, rote memory, muscular efficiency, brain capacity, mental alertness, capacity for planning, and general mental ability.

However, though the conditions for investigation were far more favorable in Hawaii than elsewhere, it is undeniable that all cultural effects were not eliminated. The immigrant groups had been drawn from communities with different social backgrounds, and to some extent these backgrounds projected themselves in the shape of customs and attitudes, into the new life in Hawaii. Even the effect of educating the children all together in the same schools with the same cur-

riculum did not obliterate altogether the cultural influences exerted through their parents. Notwithstanding the fact that the supposed cultural advantages did not always operate in the expected direction, I felt that the differences in racial background of the parents might quite conceivably introduce a variable—though one of diminishing importance—into the problem.

It seemed necessary, therefore, to go still further back and to study the reactions of more primitive peoples, who, though living in widely separated environments, were culturally at or about the same levels. The expeditions to Northwest and Central Australia in 1929 and to the Kalahari Desert and other parts of South Africa in 1934 were the outcome of my desire to study the problem of racial differences in more primitive settings.

For the opportunity to do the work in Africa, I am indebted first to the Carnegie Corporation of New York, which under terms of a Visitor's Grant made the trip financially possible; and secondly, to the University of Hawaii, which gave me the leave of absence necessary to complete the work. The scientific necessity of extending our racial studies is, I believe, fully realized by President Crawford and the Board of Regents, for without their encouragement and permission the work could not have been done.

In the actual field work my greatest indebtedness is to Mr. John Knobel, who accompanied me as guide and interpreter into the country west of Molepolole. Later on he went with me north into Ngamiland, a region quite unfamiliar to him, but where his knowledge of Sechuana, the native language, was of utmost value. To Colonel C. F. Rey, Administrator of the Bechuanaland Protectorate, my sincere thanks are due, not only for permission to travel at a time when the country was under strict quarantine on account of

hoof and mouth disease, but for assisting me most materially with letters to his administrative officers. He also gave each member of our party a permit to shoot game, so that Mr. Knobel and Dr. Kuhns, who also accompanied me, were able to keep us plentifully supplied with fresh meat, a circumstance which attracted and held natives at our camp, giving me the opportunity to test and measure them.

In planning my itinerary and work a number of people were of great assistance. Chief among these should be mentioned Dr. Charles Loram of Yale, Professors Dart, Hoernle and Mrs. Hoernle of Witwatersrand University, Dr. Oswald Black, Mr. Jowitt, Director of Native Development, Southern Rhodesia, Mr. Rheinallt Jones and Dr. Edgar Brookes of the Institute of Racial Relations, Johannesburg.

After my visit to the Kalahari Desert and the work with the Bushmen had been completed, I was able to undertake studies among several Bantu tribes at various missions, my wife acting as assistant in the testing program. To the Rev. and Mrs. Louw at Morgenster, Dr. and Mrs. Willis and Mr. Curtis at Mt. Selinda, and the Rev. and Mrs. Cuenod at Lemana, our most grateful thanks are due, not only for facilities for work, but for the hospitality of the respective missions. In Johannesburg, due to the kind offices of Mr. Rheinallt Jones and Mr. Wellbeloved, we were given permission by Mr. Du Plessis to work for three weeks at the W. N. L. A. compound, of which he is manager.

Among others to whom acknowledgment should be given is the Rev. Botha of Pamushana Mission, who guided us to a cave just discovered by Mr. Jon Botha, and which contained excellent examples of Bushman art. Mr. H. J. T. Dumbrell, Inspector of Schools, also gave me most valuable suggestions for planning my work in Bechuanaland.

As explained in later pages, the present book deals only

with racial comparisons in certain aspects of intelligence. The publication of a second volume must await the opportunity to do further field work.

S. D. PORTEUS.

Honolulu,
April 3, 1937.

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INTRODUCTION

FOR many centuries the interrelationships of peoples have been profoundly affected by the theory that the differences between races are real and of great importance. The responsibility of governing races supposedly inferior to his own is considered to be the white man's burden, and the duty has been wholeheartedly assumed all over Africa, India, the Malay Archipelago, Australia, New Guinea, and with somewhat less assurance elsewhere. It is probably no exaggeration to say that the daily lives of six hundred millions of dark-skinned people are in some way or another affected by this hypothesis.

But the theory goes further, and is made of far wider application than to the differences between white, brown and black. It extends to the various divisions of the Caucasian race. Hitler, for example, proclaims his belief that so-called Aryan people are innately superior to all others and directs his policies both domestic and foreign in accordance with that belief. The quotas established to control immigration into the United States have as their basis the idea that the peoples of northern Europe—the Nordic sub-race—are more desirable as potential citizens than those of the Mediterranean group. It is interesting to note that in Aristotle's time the advantage was supposed to lie the other way, for he held that though bravery and spirit could be conceded to the northerners, they were considered inferior to the Greeks in intelligence and capacity for political organization.

When extravagant or unfounded claims are made on behalf

of any section of mankind, whether it be the Anglo-Saxons, Teutons, Aryans or the White race in general, it is only to be expected that those claims will be opposed with equally unbalanced zeal. It is so easy for opinion to swing from one pole to the other, from the extreme viewpoint that racial differences are all-important, to the other extreme of considering them of no significance whatever. When acrimony and resentment already becloud an issue, it is difficult even for scientists to be properly objective.

To the vast majority of people, at least to those who belong to the reputedly superior race, the significance of racial differences seems self-evident. The physical diversities of races are apparent to all; so, too, the inequalities of cultural status and achievement. In the individual there is a significant correlation between intelligence and achievement; hence, many assume that a similarly close correlation must exist between racial intelligence and cultural standing.

At the other pole of opinion are those who believe that racial differences, like beauty, are only skin deep. They would ascribe all the inequalities in achievement and status, not to innate racial qualities but to circumstances, and the accidents of environmental situation. They point to the undoubted fact that the backward races are to be found in the most unfavorable and repressive environments, while, on the other hand, the advanced races enjoy all the industrial, social and climatic advantages that a favorable situation can afford. Reverse these conditions for a sufficient time, say the race levellers, and the positions would be reversed—the whites sunk in savagery, the dark-skinned peoples supreme. It has even been suggested that exchanging a thousand negro children at birth with a thousand white babies and subjecting each group to the other's nurtural influences would prove that innate capacities have nothing to do with relative racial

status. Needless to say, no one will ever have the opportunity to perform the experiment.

As to the environmental situation of races, it should be mentioned that the backward peoples have usually been forced to dwell in the unwanted regions of earth, by their inability to compete with their stronger neighbors. We are left, then, with the old problem—are races backward because they inhabit the worst environments, or do they live under unfavorable conditions because they are backward?

The theory that environmental causes are sufficient to account for all the observed differences in racial capacity would seem to be a reaffirmation of the idea that all men are equal in potentialities. This latter proposition has had support from the writings of at least one well-known psychologist, who, to borrow Hooton's phrase, "seceded in a body" from the rest of his colleagues when he made the following statement:

"Give me a dozen healthy infants, well-formed, and my own specified world to bring them up in, and I'll guarantee to take any one at random and train him to become any type of specialist I might select—doctor, lawyer, artist, merchant-chief, and, yes, even beggarman and thief, regardless of his talents, penchants, tendencies, abilities, vocations and race of his ancestors. I am going beyond my facts and I admit it, but so have the advocates of the contrary and they have been doing it for many thousands of years." ¹

Whether this statement has any serious meaning depends entirely on what Watson calls "well-formed." There are many apparently healthy, well-formed feeble-minded individuals, and of course Watson would be forced to exclude them from such an experiment. Unfortunately, our present neurological knowledge does not enable us to say whether or not an individual has a well-formed brain. Even after the

¹ Watson, John B. *Behaviorism*, p. 82.

person is dead, and his brain tissues are available for inspection, it is impossible for a neurologist, except in the pathological or grossly sub-evoluted case, to distinguish accurately between superior and inferior brains.

Since there is no dividing line between mental dullness and feeble-mindedness, mental defect being of a graduated nature, Watson would be compelled to make a further exception for the dull and retarded. Hence, all his statement means is that, given individuals of normal ability, they could be trained equally well for any profession. Even this statement, however, is open to question, if Spearman's theories of mental ability are sound. This psychologist has presented considerable evidence for the view that we each possess a certain fund of general mental ability or mental energy, which is called 'g' and which operates more or less in every thinking situation. We also possess, in lesser or greater degree, certain special abilities designated by the symbol 's,' which operate only in specific situations. Thus the possession of 's' may account for musical, artistic, or mathematical capacities. If this theory is accepted, then it would not be so easy to train one individual as another for professions where 's' of a particular kind comes largely into play.

If we grant that there are individual differences in intelligence—and even Klineberg, one of the foremost critics of the theory of racial differences, states that the facts "argue strongly" for such a hypothesis—there seems to be no good reason to expect otherwise than that there should be group differences in mentality also. In mankind as well as in other animals we know that there is a tendency for strains to appear—groups of individuals who resemble each other in skin, hair and eye color, body build, physiognomy, etc. When this tendency becomes sufficiently marked, we speak of types. Enlarge the type and cause it to become isolated through geo-

graphical, political or other barriers, and there is set up what Hrdlicka calls a nascent race. The fixing of the characteristics is, of course, due to the effects of intermarriage and heredity. When we consider that in fifty generations an individual requires over 1,000,000,000,000,000 ancestors (one thousand million million), then we realize the immense amount of intermarriage that has taken place in countries such as Japan or England, ensuring that all Japanese or English are related.

Now, while the physical differences are being set by heredity, the same differentiation from other races may be brought about with regard to mental factors. Hence, one nascent race may vary from another on the average as regards both general and special mental abilities.

It cannot be emphasized too strongly that the question is not necessarily one of racial superiority but of racial differences. Indeed it is most unlikely that any race will have developed all-round mental superiority. There is no tribe of super-men in either mental or physical attributes. The Australian aboriginal or the negro may quite conceivably in some directions be superior to the white man. The fact that there is also overlapping among races so that very intelligent men may be found among primitive races and very unintelligent among the civilized needs no demonstration.

As we have previously noted, there are many who admit the reality of racial differences in capacity but would ascribe them wholly to environmental factors, among which are mentioned superior education, cultural forms and institutions, government, material wealth, etc. But it must be remembered that these are themselves the products of human invention and intelligence. It would seem for the most part that a racial group has just about the government, religion and education that it deserves to have. In the last analysis it is only the differences in habitat or physical environment that are fortu-

itous. If, as the race levellers claim, all racial groups are potentially equal in intelligence, then the superior achievement of a race must have come about in and because of a superior physical environment. Hence, so runs the argument, Egyptian civilization rose to its heights, not because of any inborn superiority of the Egyptians, but because of advantages gained by living in the fertile Nile valley. Conversely, more backward races did not evolve a similarly advanced culture because their environments were repressive.

But that the more unfavorable physical environment does not always have a depressing effect on the mental capacity of the inhabitants seems to be proved by an experience of my own. The Australian aborigines are an extremely primitive people, who at one time had an unrestricted range all over their continent. The arid center is, as we shall see later, one of the most unfitted for human habitation to be found in the world. In contrast with the well watered, well stocked Northwest of Australia it is extremely repressive. In 1929 I visited both regions and all the evidence that I could gather pointed towards the superiority, not of the natives living in the more favored environment, but of the Central Australians. The results of this study are reported elsewhere and will be referred to later.² I would like to emphasize the fact that it is far from my intention to minimize or to disregard the effects of environment. All I am concerned with is that the hereditary factors should be given their due weight.

When, however, we come to measure the extent of these differences in mental capacity, the investigator is at once faced with special difficulties. Much of the criticism that has been advanced against the methods of investigators is due probably to the fact that in many studies these difficulties or ob-

² Porteus, S. D. *The Psychology of a Primitive People*. Edward Arnold & Co., London. Longmans Green & Co., New York.

jections have not been properly recognized and no attempt has been made to equate conditions or to eliminate unfair methods of comparison. It may be worth while to review several of these justifiable criticisms of racial investigations.

If we are using mental tests as our means of approach to the problem, then it should be obvious that those which are given in language which is only partly comprehensible to the subjects of the study are practically valueless. We should in such a case be measuring, not mentality but merely familiarity with the language medium. Similarly, if the test material is drawn entirely from a civilized environment, then the test would merely measure the degree of association with whites. A vocabulary test, for example, though excellently adapted for the average white, might be grossly unfair to the negro, even though the latter is English-speaking.

Even when the student limits his choice to what are called performance tests, difficulties with regard to language and unfamiliar background may occur. These tests themselves have no language content and usually consist of such practical tasks as matching blocks of various shapes, building up color designs, or fitting in the missing parts of a picture. There are very many tests of this nature, but singularly few of them are suitable for application to primitive peoples. In some cases, though the task is of the performance type, the instructions that are necessary in order for the subject to understand what is required of him are verbal, and in some cases quite complex. Such tests are manifestly inapplicable, as the instructions must then be interpreted—a very unsatisfactory procedure.

The content of some performance tests is incomprehensible to primitive people. Pictures have been substituted for verbal problems in many tests, but it is only very rarely that the pictured situation falls within the experience of the native. Many other tests which might be interesting to primitive man,

such as the assembling of different parts of an object, are almost valueless because the object is strange to him.

That the test itself should be of interest to the subject is a prime consideration, and this is a matter that is very difficult to decide in advance of experience. Contrary to popular belief, savages are not children to be attracted by anything brightly colored, novel or strange. They are adults with the usual adult antagonism towards being required to do anything that seems to them childish or unfitted to the dignity of a mature person. Being extremely courteous, they will usually do what the white examiner asks, but will perform the task in a most perfunctory way.

Still another difficulty is the fact that uncivilized man cannot understand why the white man should urge him to hurry with a task that by its very character seems inconsequential. If there is anything of importance about the test, it would seem to him that it should be done correctly rather than quickly; and the more interesting the task the more reason for doing it deliberately. Hence, tests which are scored on speed do not usually fit into a program of racial comparisons.

Even though the experienced investigator may by his choice of tests avoid these pitfalls, there is still a supreme obstacle in the path, namely, that it is not at all clear what it is we are trying to measure in the various races. It seems essential that we should have, to begin with, a more satisfactory definition of racial intelligence.

Many of the proposed definitions have as their basis the capacity to adjust to environmental conditions. But many of the so-called lower animals are excellently adapted, so that a further distinction is necessary. One commonly accepted definition runs: "Intelligence is the capacity to make adaptations to new conditions of life." A variant is "the ability to consciously adapt our thinking to new requirements," the in-

clusion of the word "new" being intended to emphasize the progressive nature of the adaptations.

In the writer's opinion, this emphasis should be placed not on the novelty of the conditions but on the newness of the adaptations, thus making progressive adaptability to the old problems of life the touchstone of the definition. Recently, however, I have attempted to define intelligence as the capacity to enlarge the significance of environment, thus making *knowing* an essential part of the idea.

As an illustration of the application of this definition, we may take this situation. A goldfish in a bowl, a dog, a child, and a man placed in a room together have exactly the same environment, but the significance of that environment varies according to the intelligence of each. The pictures on the wall and the books on the shelves have practically no meaning to the fish or the dog. The persons in the room, however, though of no consequence to the goldfish, may be much more significant to the dog. The child has not yet reached the level of the man but in so far as it has the capacity to enlarge the significance of its environment to match that of the man it is equally intelligent. Racial progress also seems to depend on finding increasing relevancy in environmental stimuli.

It may clarify our problem considerably if we enquire by what means and in what directions our environment becomes more significant. It is possible to recognize certain classes of relevant stimuli. In the first place there is what is called the world of ideas, in which we require the ability to deal with symbols—in short, abstract learning capacity. Secondly, there is the world of men—perhaps the most important class of stimuli to which we respond. In the third place there is the world of things—in our civilization mainly a world of machines. To these I would add a fourth class, the products of artistic effort, the world of imagination.

It seems that any comparisons of racial intelligence in the sense of capacity to enlarge the significance of environment must take into account progress in all these directions. Obviously, it would be extremely difficult, if not impossible, to make comparisons of more advanced races in these respects, but in the case of primitive peoples such a plan might be feasible. How should this plan be followed?

Since progress towards a higher degree of civilization depends in large measure on educability, we must endeavor to obtain some index of general learning capacity. Though advances frequently take place under the stimuli of great leaders, the group as a whole must be of such average mental calibre that it can respond to such leadership. Mental tests have been most successful in gauging the learning capacity of the individual, and we may expect a similar usefulness when they are applied to groups. There is, for example, a relationship between the development of rote memory for unrelated material and the ability to master such things as spelling and arithmetic so that a measure of this capacity in primitive peoples would be useful.

Since an organized social life is essential to racial survival, especially where the environmental pressure is severe, a survey should be made of the expedients that have been devised by a group to cement or support the social order. In primitive societies there are to be found many customs which have the effect of strengthening social cohesion. Hence, we are concerned, not with the social planning of a single generation, but of many. So much is this the case that the original value of any custom may be lost to the view of those who follow it. For example, the secret life of the Australian aborigines consists largely of ceremonies and traditions, which are the jealously guarded property of certain tribal groups, so that the sharing of this psychic inheritance has an undoubted welding

COPY

effect on the group. The most intelligent social order seems to be one that is strongly cohesive, yet not so completely conventionalized but that the individual has some opportunity to exercise initiative and to reap the fruits of his planning and foresight. The present volume does not attempt a detailed survey of comparative social organization, but in as much as some of the tests used put a premium on foresight and planning, the results will have some bearing on primitive reactions to the world of men.

The next field of investigation in comparative psychology would be concerned with a race's knowledge, use, or mastery of its physical environment. Here we have an analogy to the individual's adjustment to the work-a-day world—the world of things. As regards the primitive groups, this enquiry would have most to do with the means by which subsistence is assured. Here again this knowledge of the food resources and how they may be obtained and used is not the product of any single generation's experience but is the accumulated wisdom of the race. The value of this experience in the life of a primitive people is most apparent under conditions of exceptional stress, such as the periodic droughts and attendant scarcity with which savage man must contend. In this connection the work of Tindale in Central Australia must be highly commended. With a single white companion he lived with an aboriginal tribe for four months, following all their nomadic wanderings and taking moving pictures of their everyday life. Records such as this will be of tremendous value in enabling us to realize the difficulties of existence in such a habitat.

Finally, in attempting to assess racial intelligence, we must not neglect the world of imagination. After we have considered educability, the means taken to ensure the continuance of corporate social life, the knowledge of the physical resources of their habitat, we come to the question of the

imaginative life. Whenever the season is propitious and the pressure is somewhat relaxed, primitive man turns to story-telling, the recitation of the mythical history of the tribe, the carrying out of symbolic ceremonies, the singing of tribal songs, and to the dances that often serve to express his sense of close relationship with all that is about him. These things make up the psychic life of the tribe, and are hence of great importance.

It was a great step forward when graphic representation was added to the repertoire of imaginative skills. It is quite possible that drawing, painting and sculpture had their beginnings in the sign language, in which animals, etc., were represented by descriptive gestures. The form of graphic representation most used by the Australians is that of imitating with utmost fidelity the tracks made by various animals. For example, the dingo's footprint is imitated by first pressing the ball of the thumb in the dust and then making the toe marks in proper position with the little finger. If the animal is represented as running, the claw marks are put in by scratches with the finger nail. These imitations must be exact and any departure from reality is greeted with derision by the onlookers.

The setting up of such high standards of performance in this form of graphic art, may well have served as a handicap in the pursuit of other similar activities. The aboriginal artist who essayed to depict a man or a kangaroo in a rock painting found that his crude efforts were subjected to such criticism that little social approval attended his work. He was not, therefore, tempted to persevere. With the Bushmen of South Africa, the case stands differently. Evidently possessing a special talent for rock painting, the Bushman artist gained considerable applause for his skill in depicting the animals of the chase, as well as hunting and battle scenes. In

passing, it may be remarked that the human figure could be conventionalized. Anyone could recognize a man, but the depicting of the animals had to be done with the utmost care.

It should be recognized, of course, that the mental test approach is entirely inadequate to measure the group response to all four classes of stimuli, but that it has reference mainly to educability. The results reported in the present volume have, therefore, a limited reference, leaving to a future time the comparisons of social organization, knowledge and use of physical environment and artistic skill.

The chief reason for the postponement of these comparisons is the necessity of meeting the objection that such differences as are found may be due to environmental factors. It has seemed necessary not only to select for study two racial groups who are both close to the nadir of culture but also to make a very careful and detailed comparison of the conditions of life in their respective environments. Strangely enough, the influence of environment, whether repressive or favorable, has been invoked both ways to explain lack of racial progress. The negro in America, argues Watson, failed to develop because of a repressive social environment. In Africa he failed to develop because the physical environment was too favorable. There, he says, "food, sex and shelter offer no problems" and so "there is nothing in the environment to force the trial and error movements that lead to discovery."⁸ If Watson believes that food, shelter and sex offer no problems in Africa, then it is plain he has never been there.

The races chosen for the purposes of this study have been the Australian aborigines, particularly those in the center of the continent, and the Bushmen of the Kalahari and Ngami-land regions in South Africa. Visits were paid to each coun-

⁸ Watson, John B. *The Ways of Behaviorism*, p. 39.

try, the African expedition of 1934 having been financed and approved by the Carnegie Corporation of New York; the Australian field work by the Australian National Research Council in 1929.

The Australian environment has been already described in a previous book so that in the present volume more attention has been paid to the living conditions of the Bushmen in the Kalahari.⁴ This part of the book also contains data which may later be used in the comparison of the respective adjustment of each race to its physical environment. Following the plan of "The Psychology of a Primitive People," I have endeavored to present the environmental picture through the medium of a narrative of travel.

By thus devoting special attention to this phase of the problem, we may hope to diminish the force of the common objection that nurtural handicaps have not been taken into account. If under conditions of equivalent environmental stress it can be shown that the two groups have achieved different levels of development in different directions, it would seem to me that the study should provide a clear demonstration of the reality and significance of racial differences in intelligence. If, as is probable, complete equation of the nurtural conditions is impossible, then we can at least show that the mental advantages, such as they are, are not possessed entirely by those who enjoy the more favorable living conditions. In either case the environmental picture must be presented, so that the demonstration of racial differences shall not be weakened.

⁴ Porteus, S. D. *The Psychology of a Primitive People*.

CHAPTER I

THE AUSTRALIAN ABORIGINES

THE early history of the Australian aborigines is, of course, lost to view, but there are several theories as to their origin and course of dispersion throughout the continent. In all probability the Australian race represents one of the earliest migrating streams from the ancestral home of mankind in southeast Asia. Pressed upon by stronger tribes they probably made their way still further to the southeast, eventually reaching islands such as Timor and New Guinea. From some point or points along this route a group branched off to enter and populate Australia. The physical homogeneity of the race and the fact that the other peoples bordering on Australia do not share to any marked extent its physical traits would indicate that the migratory stream into Australia was not long continued, and that those who were left behind along the way were rapidly exterminated or absorbed by superior peoples, leaving those who entered Australia almost the sole representatives of the race. Though the evidence is meagre, the pre-Dravidian peoples of India and Malaya are sometimes considered backwaters of the early Australian migratory stream. Indeed these peoples are commonly designated Australoid.

It is also considered probable that the group which reached Australia may have been very small, possibly only a single biological family, and that they came there wholly by accident. There are two likely places of entry, the first at Cape York Peninsula where a narrow strait separates the

mainland from Papua. It has seemed to me that there are two chief objections to the theory that this was the point of entry. One is that if this was the corridor of migration, there was no reason why it should not have remained open to a constant stream of ensuing immigration. In time, then, Papuan characteristics and culture would have spread south and we should find the Australian and the Papuan closely related. As a matter of fact, while there is evidence of infiltration from Papua, it has apparently been slight and comparatively recent, so slight in fact that the main population of Australia is unaffected.

Where an infusion of Papuan blood has taken place, the results seem to be at once apparent. Miss McConnel, who has studied the coastal tribes of the Cape York Peninsula, comparing them with inland people such as the Wik-Munkan, has observed the occurrence of Papuan features. She says, "Generally speaking, the hair of the coastal people is curly and often quite crisp, standing up off the head in a mass like that of the Papuans. There are, however, individuals with straight hair. . . . The facial expression is more mobile, and sometimes the nostrils have a chiselled effect. In disposition they are more responsive and more temperamental than the Wik-Munkan. The latter have on the whole heavier features and their hair, usually curly or straight, is only rarely frizzy. These differences may be due to an intrusion of Papuans along the coast at some former time." ¹

The point of these comparisons lies in the fact that throughout the rest of Australia these Papuan characteristics are rarely seen, being apparently quite distinctive. Sir William Turner's statement can still be accepted. "The bal-

¹ McConnel, Ursula. The Wik-Munkan Tribe of Cape York Peninsula. *Oceania*, Vol. I, April, 1930.

ance of opinion," he says, "is indeed in favor of the view that throughout Australia the present natives conform to one pattern in features, color, and mental character, though possibly on the coast local infusions of Papuan, Polynesian, or Malay blood may from time to time have been introduced among them."

Ling Roth, on the other hand, believed that the Tasmanians were the original inhabitants of Australia and that they were dispossessed by the present wavy or straight haired people. Mathew, mainly on linguistic evidence, held the belief that the Australians came from Papua. There are some traces of Australian affinities in Papua but less of Papuan influence in Australia. This is quite consistent with the view that the Papuans overran and exterminated the island representatives of the Australoid race, adopting some of their customs before so doing.

The other objection to considering the Cape York Peninsula the corridor of entry into Australia lies in the fact that if the fertile eastern seaboard of the continent was first occupied, it would be difficult to understand how the arid portions of the continent came to be inhabited, since this well watered area might easily have supported all the Australians who at the one time populated the continent. The present aboriginal population of the continent is estimated at from forty to seventy thousand, and it is unlikely that it ever amounted to more than four hundred thousand, who were by no means concentrated in the temperate and fertile southeast but were sparsely scattered all over Australia. Apparently there was no desert too arid, nor any region so unfavorable for human occupation but had its aboriginal inhabitants. During the whole period of white settlement, there have been no native wars of any importance nor pressure of tribe on tribe, and certainly no such thing as terri-

torial conquest; and, unless the psychology of the aborigines has radically changed, there never has been, apart from local feuds, any inter-tribal pressure. This suggests either that the desert areas were among the first parts populated or that these areas became arid after aboriginal settlement had taken place.

If we could accept the view that ingress to the continent came through some other point than the extreme northern tip and particularly that the fertile eastern seaboard was settled last, we could readily understand the sharp division that exists between the Papuan and the Australian races. We could assume an indigenous population already in possession of the continent before the Papuans had reached the New Guinea side of Torres Strait, a population sufficiently strong to resist any invasion from the north, and sufficiently stabilized in their own culture to repel Papuan influences.

Eyre's view was that the Australians first reached their continent at some point along the northwestern coast between the twelfth and the sixteenth parallels of latitude. This seems to me a particularly reasonable theory, except that I should place the point of entry further south. Along this coast are a number of small rivers such as the Ashburton, De Grey, Fortescue and Oakover, which lead quickly inland, and beyond whose headwaters lies a vast arid or semi-arid hinterland. As population increased, the natives would make their way eastward along these river valleys, and soon a fringe of native settlement would be thrown out into the desert, which though extremely arid contains such plants as the nardoo, the munyeroo, and the yelka bulb, which form some of the stable foods of the aborigines today. In the meantime, while this slow penetration of the interior was taking place, a much more rapid dispersion was taking

place along the periphery of the continent. Finally the central stream of population, spreading fan wise through the country, met at many points the tribes whose movement had been an encircling one. Such numerous contacts form a necessary assumption in order to account for both the cultural and physical homogeneity of the race. It is probably in this sense that the interior can be regarded as a center of cultural diffusion, even though the most important cultural devices may or may not have originated there. In any case many of the distinctive Australian customs, whether evolved in the desert or not, may be regarded as excellently adapted to conditions where the struggle for subsistence was exceptionally keen.

Professor Elkin in speaking of the northwestern area notes that "there is a great diversity of types of social organization, more particularly as regards kinship systems and marriage divisions, and also many differences in material culture in various parts of the area." This diversity would indicate either that the area was the meeting place of long separated tribes or merely that this being the oldest settled region, there was more time for differences in culture to develop.²

An instance of the results of the converging of two streams of migration and the consequences of this meeting is to be seen in the center itself. There the Arunta, representing a southerly stream moving inland from the direction of the Ord River in the Kimberley district, have met near Hermannsburg with what is probably an older stratum of aboriginal population, the Luritcha, who probably represent a more direct westerly migration. The two peoples differ somewhat physically, and speak two different languages although

² Elkin, A. P. *Social Organization in the Kimberley Division. Oceania*, Vol. II, No. 3, p. 298.

they have a sign language in common. According to Elkin's and my own observations, the marriage system of the Arunta is spreading to the Luritja and no doubt some Luritja customs are being taken over by the Arunta. Here is an excellent example of how the marked cultural and physical homogeneity of the Australians is maintained.

Ellsworth Huntington^a in a review of the book in which I proposed this theory of an early settlement of the more arid parts of Australia followed by subsequent infiltration of population into the more fertile regions would place this settlement at a time prior to the desiccation of the interior. He says, "The aborigines apparently penetrated to the center of Australia at a time of greater rainfall. As the rainfall diminished they were forced either to perish, to migrate, or to evolve a culture that would cope with the desert. Doubtless all these things happened to certain groups. For our purposes the important part is that after the increasing harshness of the climate had led to a highly developed desert type of culture, the aborigines from the central regions were forced to migrate outward. They presumably overcame the dwellers in the marginal areas who were weaker both physically and culturally."

Huntington's belief that the aborigines populated the center of the continent prior to its desiccation may be correct, but his picture of stronger tribes overcoming their weaker neighbors presupposes a condition which, as we have indicated previously, has apparently never existed in Australia.

Since the era of white settlement, the native population has steadily and surely declined. Victoria, the most fertile and well watered state in Australia, once contained numerous tribes who were grouped together under such names as

^a Huntington, Ellsworth. Why Are Races Different? *Saturday Review of Literature*, Feb. 1932.

the Kulin nation, including such tribes as the Wurunjeri and Bunarong; in the south were the Kurnai or tribes of Gippsland; in the west the Mara and the Wolgal in the northeast. These were only a few of the important tribes. Despite this variety of tribal groupings, it is evident that together they did not make up anything like a numerous population. Otherwise, they would have survived to this day in greater numbers. Forty years ago, while there were still large unsettled areas in Victoria, the aboriginal population of the state had shrunk to a few hundreds, while at the present time, after a hundred years of white occupation, there are only a couple of score of full bloods left. The white man's diseases—smallpox, tuberculosis, venereal diseases—undoubtedly took heavy toll, but considering how scattered the natives were it is strange that depopulation from this cause should have proceeded so rapidly. In all probability this rapid disappearance is in part due to the fact that they were never, even in this most fertile portion of Australia, very numerous. In New South Wales and South Australia once important tribes, such as the Kamilaroi and Narrinyeri, have also almost disappeared. Only in Queensland, Arnhem Land, the Kimberleys in the northwest and parts of Central Australia are any considerable number of natives living today.

Professor Elkin, after a recent visit to the tribes of South Australia, noted that depopulation there was very far advanced. A ten years' drought had driven the natives in many cases to the borders of white settlement, where they found subsistence easier. At Mt. Margaret in Western Australia he found two hundred natives, only one of whom belonged to the local tribe. Some had come in from a distance of two hundred and fifty to three hundred miles. His estimate of the original population of the western portion of

South Australia was two thousand, of whom perhaps nine hundred remain.⁴

If these estimates are correct, then we have the peculiar situation of a larger proportion of the aboriginal population surviving where once it was thinnest, and almost complete extinction in what were once the most thickly populated parts. This fact serves to illustrate two interesting points: the first, that contact with whites is by far the most devastating factor in the existence of the natives, much more serious than the combined hazards of starvation, thirst and loneliness in the desert; the second point is that aboriginal life must have become excellently adapted at many points to the tremendously difficult conditions that the interior of Australia affords, for the surviving tribes have had not only the desert but the white man's diseases to contend with, since these latter have had ample opportunity to become spread throughout even the sparsely peopled areas. Apparently it is not so much disease as the breaking down of social organization that sounds the death knell of native life, and this breakdown immediately follows the moving in of natives from the desert into the white settlements.

There is a psychological factor involved in this situation. With the decay and disappearance of all the psychic elements of their own culture, the natives have less to live for. Children become a burden, and abortion and infanticide the rule. Then, too, it must be remembered that the aboriginal, like most primitive people, is most suggestible and the inroads of death and disease among his group induce hopelessness and fear. Once the aboriginal is persuaded that he is doomed, mental and physical resistance sink to a minimum. Firth puts the situation very concisely when he says,

⁴ Elkin, A. P. The Social Organization of South Australian Tribes. *Oceania*, Sept. 1931, p. 48.

"The psychological factor in itself may not be a pure cause of decline of population, but as leading to decreased work and so to food deficiency, to concentration in brooding inactive groups, and so to increased susceptibility to disease, it is surely not without its effect." ⁵

Here, then, we have a striking example of a most important race difference compounded of both cultural and innate factors. The condition of life which is most favorable to the whites—*i.e.*, living in settled communities—is fatal to the aborigines. On the other hand, the latter maintain themselves under circumstances and in regions where life is almost impossible for civilized man. Again and again, white settlers have established themselves in parts of the center only to be driven out broken and discouraged by the droughts. Though life is most difficult at times for the natives, they still manage to survive. As Elkin says, "The environment is an exceptionally hard one. The droughts are severe, and during them game, reptiles and seed-bearing grasses almost die right out. Famine stalks the land and men are sometimes driven to eating their own dogs, a circumstance which is regarded with both contempt and sorrow. Further, in such periods babies are frequently not allowed to live, and in some cases, at least, are eaten."

It is under circumstances such as these that, according to the same authority, forty-five per cent of the original population still survive in this particular district, for the area of which this is said—western South Australia—is one of the most unfavorable to human survival in the continent. This speaks eloquently for the organization by the natives of all social, mental and physical resources for the purposes of survival. Professor Elkin is inclined to question my hypothesis that the Australian social system has been evolved or

⁵ Firth, Raymond, *Anthropology in Australia, Oceania*, Sept. 1932.

adapted to suit these most difficult environmental conditions, but if it was not so evolved, then the aborigines were indeed fortunate that they arrived in the arid and semi-arid interior equipped with an excellent system so suited to insuring survival in these inhospitable regions.⁶ Personally, I cannot look upon the Australian ways of living and customs as being anything else but conscious adaptations to desert life, and if this is so, then it is legitimate to consider the people of the arid areas as being culturally dominant, placing their impress on the whole of native life throughout the continent, which, as has been pointed out by Elkin and others, is so remarkably homogeneous. Though tribes living side by side speak entirely different languages, the culture pattern is remarkably similar. So much is this the case that strangers coming to a tribe from long distances can be allotted to the marriage division or class which is equivalent to their own tribal section, and once this is done they can at once fit into the complex scheme of kinship with the manifold obligations, avoidances, etc., that such relationships entail.⁷

Physically, also, the Australians are remarkably homogeneous. In the Kimberley districts of northwest Australia, however, two types are to be observed, the one tall and slender in build with relatively low sitting height; the other shorter and more thickset, very similar in build to the natives of the center. The Luritcha are predominantly of this type, while among the Arunta, taller, more slender individuals are to be observed. The long, slender build is exemplified among the women also in the Fitzroy Valley and beyond, and these characteristics may possibly be due to some distant Malay admixture.

⁶ See the discussion of this theory in Chapter XV of *The Psychology of a Primitive People* and Elkin's review in *Oceania*, Sept. 1932.

⁷ That the system is adaptable to suit different conditions seems to stamp it as a functioning mechanism gradually evolved to suit definite social needs.

Apart from these bodily variations, Australian aborigines the continent over are in facial appearance remarkably similar. They are extremely hirsute, the hair being black and wavy or curly, rarely straight. In hair character they differ on the one hand from the Mongols with their long straight hair and on the other hand from the Negroid or Negritos with their sparse tightly spiralled whorls or, in other cases, woolly tufts of hair. The Australian is further distinguished by a wide mouth and usually very prominent supra-orbital ridges and rather large cheek bones.

One of the clearest impressions of aboriginal appearance was made on the first Englishman who essayed their description. This was Dampier, the old buccaneer-explorer who visited the northwest coast in 1688 and in 1699. His description of the natives is in most points very accurate and in general has rarely been surpassed.

"The inhabitants of this country are the miserablest people in the world. The Hodmadods, of Monomatapa^{*} though a nasty people, yet for wealth are gentlemen to these, who have no houses and skin garments, sheep, poultry and fruits of the earth, eggs, etc., as the Hodmadods have; and setting aside their human shape, they differ but little from brutes. They are tall, straight-bodied, and thin with long limbs. They have great heads, round foreheads, great brows. Their eyelids are always half-closed to keep the flies out of their eyes, they being so troublesome here that fanning will not keep them from coming to one's face. . . . They have great bottle noses, pretty full lips and wide mouths. The two foreteeth of their upper jaw are wanting in all of them, men and women, old and young. Whether they draw them out I know not. Neither have they any beards. They are long-

^{*} The kingdom of Monomatapa was written of by the early Portuguese in South Africa and was supposed to lie somewhere south of the Zambezi, possibly around Zimbabwe in Southern Rhodesia. The Hodmadods, as Dampier calls them, were probably the Hottentots, with whom in Dampier's mind the people of Monomatapa are confused.

visaged, and of a very unpleasant aspect, having not one graceful feature in their faces. Their hair is black, short and curled like that of the negroes; and not long and lank like the common Indians. The colour of their skins, both of their faces and the rest of their body is coal-black like that of the negroes of Guinea. They have no sort of clothes but the piece of the rind of a tree tied like a girdle about their waists, and a handful of long grass, or three or four small green boughs full of leaves thrust under their girdle to cover their nakedness. They have no houses but lie in the open air without covering, the earth being their bed, and heaven their canopy. They live in companies, twenty or thirty men, women and children together."

When the comparisons of groups of Australians are made in more exact anthropometric terms, the homogeneity of the race is even more apparent. The stature of a group of natives measured by me in the Kimberley district was almost exactly the same as that of another group of Arunta natives measured in the center. Compared with the coastal natives at Beagle Bay, the Arunta, despite their more difficult environment are on the average somewhat taller. A group measured by Campbell and Hackett ⁹ in the center were, however, of about the same average height as the Beagle Bay natives.

A similar uniformity is to be found in head measurements. Campbell and Hackett's figures for head length of central natives agree very closely with mine, though in this measurement the coastal natives are 4 mm. less than the central. On the other hand, fifteen males measured by me at Moore River in Western Australia sixteen hundred miles away had exactly the same average head length. Head breadth also seems to vary to but a slight extent. As regards brain capacity, the northwestern group measured 1,323 cc., the central group

⁹ Campbell, T. D. and Hackett, C. J. Trans. Roy. Soc. South Australia, Vol. LI, 1927.

1,353, and 64 adult males measured by Burston in the Northern Territory 1,347 cc. These were not large groups so that the equivalence of the averages is another indication of physical homogeneity.

CHAPTER II

NORTHWEST AUSTRALIAN ENVIRONMENT

IF it were possible to cut off from the eastern side of Australia a slice about one hundred and fifty miles deep in the middle and tapering off to less than twenty miles at the northern and southeastern tips at, say, Cooktown and Port Augusta respectively, there would be but little really habitable land left. If we should also include a strip on the extreme southwest, one hundred miles long and fifty miles deep, the white population in the remainder of the continent would not be much more than that of the surviving aborigines. Yet the unexcised portion of the country would make up an immense area. Within this are still to be found tribes living in an extremely primitive state. Here, as in no place else in the world, the very new and the extremely old exist side by side. In Central Australia you may still find the aboriginal chipping his spearheads from broken beer bottles or from insulators taken from the telegraph line—a neolithic workman plying a most ancient art with these most modern materials. Indeed, the native much prefers to work in these, rather than in the refractory quartzite to which he was accustomed.

The other areas of the continent in which primitive tribes are still to be found are the northern and northwestern portions. In comparing the Australian with the South African environment, it will be necessary to give a brief description of these regions of native habitation.

An interesting fact is that the northwestern coast of the

continent, though it has been known longest is still known the least. This in itself is evidence of the unattractiveness of the area to white settlers, for it has been remarked that the white man will put up with any environment, no matter how distressing, if he can make money there. From Marco Polo's time, in the thirteenth century, the islands of the East Indies, such as Java, had been visited by travellers, and the proximity of Australia to these places made it quite likely that the early navigators knew of its existence. It is said, for example, that the Portuguese sailor, de Meneses, in 1527 visited and named the Abrolhos group of islands off the coast of Western Australia. Seventy years later the "great south land" was mentioned in a book written by a Dutch seaman named Wytfliet. He commented both on its vast size and its great loneliness, being visited, so he says, only by sailors unfortunate enough to have been blown from their course by the great storms that beset these seas.

The evil reputation of this region persisted, for the early Dutch navigators who sailed its shores brought back such unfavorable reports that others gave it a wide berth. In 1623 Carstenzoon described it as "shallow waters and barren coasts, altogether thinly peopled by divers cruel, poor and brutal nations," and summed it up as "the dryest and barrenest region that could be found in the world." Peter Nuys, five years later, could give no better character to the extreme southwest, which he notes as "a foul and barren shore, green fields, and very wild, black and barbarous inhabitants." Dampier's description, previously quoted, showed that some of these early explorers saw the natives at close range.

It was King and Stokes who one hundred years ago first attempted an exploration of the six hundred miles of coast between what are now the towns of Derby and Wyndham. The account of their adventures along these tide-racked

shores, where a thirty foot rise and fall is experienced in open roadsteads, did not predispose mariners to make their closer acquaintance, so that little or no careful charting was done after this time. Hence, after three hundred years of navigation in and around these waters, there are at the present time portions of the coast that are still neither fully charted nor mapped, and are visited solely by occasional luggers gathering pearl shell or *bêche de mer*.

My own approach to the Kimberley district—the wild hinterland of this savage coast—was by coastal steamer from Fremantle to Broome, a journey of sixteen hundred and fifty miles. The appearance of the shores we passed reminded me forcibly of the description penned by Baudin, the French explorer sent by Napoleon to carry the “blessings of civilization” to the peoples of this region. To him, its aspect was “altogether the most whimsical and savage, at all times raising itself into a thousand different shapes of sandy, sterile and chalky isles.” Thus, he says, “the dismayed and astonished navigator turns away his eyes fatigued with the contemplation of these unhappy isles and hideous solitudes, surrounded as he views them with continual dangers.”

As I saw these shores one hundred and twenty-eight years later, Baudin’s account might just have been written. Bare headlands, burnt brown with the fires of late summer, marched down to the sea. Here and there the coast was scored by dry gullies, marking the course of the sudden brief streams of the rainy season. As we went further north, we passed some river mouths, hidden behind the shoals and tidal mudflats, bordered by strips of fertile country, along which the early explorers gained access to the interior. Such a river was the Gascoyne, emptying into Shark’s Bay, and further on the Ashburton, the Fortescue and De Grey. As

the possible first landfall of the earliest Australians, we might examine more closely the nature of this country.

It was Sir George Grey, then untitled and a mere lieutenant, who brought back somewhat favorable reports of the land around the Gascoyne, although his party nearly perished of starvation. Austin and his party in 1854 also barely escaped with their lives when trying to penetrate the wild scrubby land between that river and the Murchison. Gregory, after following up the course of the latter stream, undertook to trace the Fortescue and the Ashburton, and found both rivers traversing open forests and undulating country. The fertility of the lower portions of these river valleys raised great hopes that their headwaters might flow from pleasant and inviting highlands suited to white settlement. Following up the Oakover and the De Grey rivers past the rim of the tableland from which they debouch, Gregory found nothing but barren drifted sand hills, and beyond that a terrible desert. Two desperate attempts to pass beyond this desert nearly cost the lives of his party and brought him to some granite hills. But instead of lakes and springs, he found nothing but blasted and barren rocks with sun-scorched, ragged ravines between.

If this was the earliest home of the aborigines in Australia, then they were not very fortunate. It is made up of arid, scrubby areas traversed by small rivers, along which fertile strips exist, the streams being likely to fail in the dry seasons and in their lower regions to be salt. Bounding the area to the south are huge belts of scrub, while to the north are wide waterless stretches. It is easy to visualize the aborigines peopling these valleys until, driven by over-population, they spread into the eastward encircling desert.

There are at present several widely separated white settlements along this coast, and of these Port Hedland may be

taken as typical. The widened mouth of a mangrove-fringed creek, subject to the ebb and flow of a twenty-eight foot tide forms the harbor. Your vessel rides in at high tide, then sits on the muddy bottom till the next tide floats it off. For the rest a low coastline of red sandstone, fretted and wave-worn; dunes covered with prickly grasses and some drought resisting succulents; bare clay pans into which the high tides of the equinoctial season overflow; and in the midst a little huddle of houses, each with its raised platform in the back yard to which the residents retire to sleep in the sand-fly season—such is Port Hedland. From here a train runs once a week to Marble Bar, a little town set in a hollow surrounded by red spinifex hills—a mining location where the sun pours down most pitilessly, raising the temperature as high as 120° , the record heat spell being one of 101 consecutive days of 100° and over. This country lies within the monsoonal belt and in the dry season the rivers may become raging torrents rolling down to the sea. But their courses are short and the run-off rapid, so that beyond tidal limits they are simply chains of waterholes. Around these waterholes, subsistence for natives must have been easy, for here is gathered in the dry season all the game from the arid areas. A few miles away from the river valley, there is almost barren wilderness—flat topped hills or mesas, rounded or jagged basaltic outcrops covered with prickly clumps of spinifex grass, the bane of everything that travels afoot. Here and there are a few straggly gumtrees, drooping hopelessly in the noonday heat.

Obviously such country could not support a large indigenous population. The crowding of natives about the waterholes would soon mean the disappearance of game and so the inhabitants had perforce to spread themselves sparsely. Strangely enough it is poverty, not plenty, that re-

quires regulation; at all points man must match the harsh demands of external environment, by equally stringent restraints of his own nature. It is in response to conditions such as I have described that the distinctive social customs and organization of the Australians have evolved. A stable communal life was the prerequisite for existence in these regions and so we find the social life of the natives bolstered and reinforced at every point. To my mind every aspect of Australian life—whether it be the system of totemism that binds together the tribal group, the initiation practices which strengthen the authority of the elders, the marriage regulations that eliminate competition among the tribal rulers, the kinship system with its manifold obligations—bears to some extent at least the aspect of an adaptation to these difficult conditions. This is what I mean when I say that these institutions and customs bear the imprint of the desert.¹

Further north of Port Hedland the country changes. In Dampier Land, where Broome, the only large town of the northwest is situated, there are no rivers worthy the name. A few tidal creeks indent the coastline, wind about a few miles through the mangroves and paper bark trees and then lose themselves in swamps or morasses. The distinctive characteristic of the peninsula is its flatness, nothing in the nature of a hill being found between Roebuck Bay on the one side and King Sound on the other. Blanketing the whole is a low forest of brush, which natives and whites alike call "pindan." It is a thick growth of acacia, interspersed here and there with cajuput or bauhinia trees, the monotonous grey-green of the rather sombre foliage being relieved occasionally by the snow white boles of the "painted gums."

Near the coastal edge of the pindan, where there are per-

¹ The disadvantages of a haphazard social organization will be illustrated in the Kalahari, where the Bushmen have almost disappeared, through competition not with whites, but with other natives.

manent springs, the slight depressions are shady with the dark green foliage of the melaleuca trees, whose ragged grey paper-bark stems lend a ghostly atmosphere to the scene at night. Breaking the almost endless expanse of the pindan are a few swampy meadows, knee high in coarse grass, each meadow roughly indented by thrusting capes of brush, through which the wallabies have their runways. In the wet season the whole of Dampier Land is a steaming, swimming morass, mosquito and gnat infested, the happy hunting ground of all the batrachian and reptilian tribes. Where these disappear to in the dry season, is beyond me to say.

Even though food supplies are fairly abundant, this region seems never to have contained a very large native population; at least primitive man has left but few signs of his occupancy. It is a strange land where ants have left more permanent records than man. Scattered throughout the forest are great nests of termites of every conceivable form of ant-heap architecture, some round like Kaffir huts, some with spires and turrets, others like huge cave stalagmites. As compared with these, the works of aboriginal man are flimsy and impermanent. He builds himself a lean-to of bushes, carves out his clubs, boomerangs and sacred slabs or *minboor* of hard acacia wood, wears a little pathway to and from the spring, and heaps up some mounds of cockle shells near the coast—these the only signs of human occupancy. The native tribes of this region are the Nyul-Nyul and the Baadi, of whom there are but few left.

Journeying east from Dampier Land, you will find the character of the country much different. In the Kimberley district, there is one great river valley capable of supporting a large native population. This is the valley of the Fitzroy, along which for two hundred and fifty miles of its course

we travelled by truck in 1929. This river empties itself into King Sound near Derby, and is a great stream twenty miles wide in the floods of the wet season, but a succession of waterholes and long reaches linked by a trickle of water in the dry. It is shaded by huge coolabars, which are shapely water-loving gums, and is flanked by what are called billabongs—quiet lagoons which remain from flood to flood, and are the temporary homes of sea-going swordfish and even hammerhead sharks. Crocodiles also make these holes their haunts.

The bird life too is extraordinary. Pelicans, jabiru—the black and white Asiatic stork—pied or magpie geese, herons and many kinds of wild duck are to be found in the water; thousands of white cockatoos line the gums along the banks and make the evening air vibrate with their discordant screeching; flocks of pink and grey galahs, white beneath the wings, rise in clouds against the setting sun; parrots of every conceivable metallic hue are to be seen everywhere, while wheeling and dipping above are the squadrons of those scavengers, the kites.

Animal life is no less abundant. The actual bed of the river winds about in a lesser depression thirty or forty feet below the level of the wide river plain. Here the trees and brush are covered with huge masses of creeper, under which during the heat of the day the kangaroos find an ideal shelter. Out of one bend a line of six aborigines and myself drove several thousands of these animals past a moving picture camera concealed at a narrow part close to the river's edge. Near this same spot we saw lace lizards or Australian iguanas nearly six feet in length, black-headed pythons and that strange survival from a bygone age the frilled lizard, which runs on its hind legs and disconcerts its enemies by suddenly expanding a flaring frill six inches and

more in diameter, which normally is folded down around its neck.

Generally speaking, along the four hundred miles that we followed the course of the Fitzroy and its tributaries, native game was abundant. Species known as nail-tailed wallabies and agile wallabies inhabited the river plain, while back in the foothills we saw the much larger red kangaroo (*Macropus antilopinus*) and several species of the powerfully built wallaroo. Yet it must be remembered that this abundance of game was found only in a restricted range within a few miles of the river valleys. Thirty miles to the south and east we could see the rim of the vast tableland that stretches away to the center of Australia.

The traveller leaves the main valley of the Fitzroy where it bends away to circle the eastern bastion of the King Leopold Range, the track crawling painfully through a stony pass. On both sides lie dry hills, treeless except for a few straggly gums, each having a queer knobby appearance due to the round clumps of spinifex which are dotted here and there all over the surface except where fires set by the natives have cleared small areas of everything but a bare rubble of brown stones. An occasional kangaroo, disturbed by the passage of the truck, may hop a few yards from the scanty shade of a eucalypt and then sit up and regard you curiously; a stray bird may be heard twittering from the spinifex cover, or a lizard dart between the stones, but of life there is singularly little. The further you go from the river valley the more barren and lonely the land becomes.

Turning southeast from Hall's Creek, the last white settlement is left behind. Sturt's Creek, unmarked by banks or timber lines, is merely a depression so that it may be passed by without notice, and after that there is nothing to

mark the way until the little mining camp of Tanami, which may or may not be deserted, is reached. Thereafter a single track, but seldom travelled, leads for several hundred miles towards the center of the continent at Alice Springs. This track is only passable by motor car or camels in the dry season, as it is practically waterless. Yet on these dry, apparently empty plains, aborigines exist. You may see their naked footprints beside the track or their distant signal fires, but you are hardly likely to catch sight of them.

That they manage to live and maintain themselves where white men would perish miserably is a proof of their wonderful bushcraft and powers of subsistence. Fertile river valleys amply stocked with game lie but a few hundred miles away and the question at once arises—why do the natives not move into these highly favored parts which would easily support a fairly dense aboriginal population?

The answer is that the Australians, of all the hunting peoples, are most firmly attached to the soil from which they sprang. It seems strange indeed that bonds of sentiment should exist between them and this barren and lonely land. Yet every creek bed and waterhole, every hill and depression, the very rocks and trees have a definite place in the myths and legends that recount the wanderings and adventures of their "dreamtime" ancestors. These natural features represent psychological cues without which this body of tradition would soon be forgotten. All the cherished ceremonies, the secret life of the tribe, are inextricably bound up with the country itself and its mythical history. Take the aboriginal out of his own particular country and he is lost in every sense, spiritually as well as actually. His psychic inheritance is gone, and without this he is nothing better than an animal pitting its wits against Nature in the struggle for survival. Barren and uninviting, and even ter-

rifying as the landscape appears to us, to the aboriginal it is historically rich and soul-satisfying.

Each family has its own hunting grounds and the larger group, the totemic clan, has also its definite territorial limits, within which other clans have no rights of entry except with the consent and invitation of the rightful owners. Ceremonies commemorating or reënacting the exploits or wanderings of the culture heroes or the totemic ancestors are the exclusive property of certain men. These may be performed by others but only under the immediate supervision of the owners. Thus social prestige accrues to the possessors of these dances or ceremonies, the ownership of which is most jealously guarded. Stripped of this inheritance, the aboriginal is poor indeed. Delocalized, he is worse than detribalized, and life becomes mere existence. Only under the stress of most exceptional circumstances will a man move into country belonging to a horde other than his own, and then only temporarily and under the status of an invited guest. Hence, there can be, in Australia, no coveting of another group's country, no matter how inviting it may seem. As has been previously mentioned, fights for the possession of land or hunting rights never occur under the Australian system. Such feuds as occur may arise through quarrels over women, but most often through accusations of the use of magic to bring about the death of an enemy. That this can be done is a fundamental aboriginal belief, so much so that death is rarely attributed to natural causes, and the punishment of the supposed sorcerer is a duty laid on the deceased man's relatives; but as to tribal wars of conquest, these do not and cannot occur. When one considers the nature of the country this fact is readily understandable.

That these apparently limitless plains, sand dunes and

stony rises, devoid of any signs of man's passing save this dim trace that winds carelessly on towards an empty horizon, could be the home of human beings seems to the traveller to be more and more extraordinary. How, in such an environment, can human society root itself with any degree of permanency? The remarkable fact remains that in these solitudes man is by no means a footloose and untrammelled wanderer, but adjusts his behavior at all points to the set forms of constituted society. Here, where there is the utmost poverty of material resources, where individual effort to maintain life is at a maximum, the reaction of panic—"Every man for himself and the devil take the hindmost"—has absolutely no application. Instead, the aboriginal submits himself to self-imposed rules and social restraints to a degree not approached by those who live in more favorable surroundings. To the central Australian the intervals are rare when life is easy and secure. His whole social system is keyed to the level of crisis and vicissitude.

This description applies to the vast interior of the continent. As we have seen, the Kimberley district, and in fact, the whole northwest, is much more highly favored. On the track from Derby to Wyndham, travellers find the main hindrances to progress in the wide stream beds of such rivers as the Margaret, the Laura, Turkey Creek, the Ord, dry in the winter time but brimming with floods in the summer season. These rivers are fed from a wild jumble of ranges that lie to the north and west, a land where the aborigines still wander undisturbed. A few white prospectors and a surveying party or two have crossed this area and now and then a police party may make a brief incursion in the hope of catching an aboriginal murderer, but for the most part it remains unknown territory.

That native sustenance is easy here may be judged from

the wild life that is to be found in its borders. Thirty miles from the mouth of the Ord we came upon wide plains, well grassed and dotted here and there by those strange Brobdingnagian trees, the baobabs. In the lagoons that are filled from the overflow of the Ord was to be seen the same profusion of bird life that we had observed in the Fitzroy Valley. With permanent streams in the Leopold Range the country would be similarly stocked with kangaroos and other animal life. Though the summer is extremely hot, droughts rarely ever come and wet season follows dry with unfailing regularity. But with Central Australia the case stands differently. There the monsoonal rains frequently fail to penetrate. The heat is just as great, and added to the burden of the summer are the long-extended, devastating droughts.

CHAPTER III

CENTRAL AUSTRALIA

My own approach to the central regions was not from the north but the south. Though it would have been possible to reach the transcontinental telegraph line and Alice Springs from Hall's Creek in the Kimberley district, it seemed easier and much more prudent to go on to Wyndham, return to Perth and Adelaide and then proceed another thousand miles north to the center. Such were the uncertainties of the direct journey that the longest way round was decidedly the safest, and so five thousand miles of easy travel was cheerfully substituted for five hundred of the hardest. For my purpose of attempting to obtain a picture of the environmental handicaps of the aborigines of the Australian Inland, the choice was a wise one. I had an opportunity to realize what those handicaps were, for between Adelaide and Alice Springs I passed through an area which had been drought-stricken for eight years. How desolate a region subject in the summer to temperatures of 120° in the shade can become after such an extended rainless period would have been beyond imagination; it had to be seen to be realized. The utter desiccation of the surface soil may be in part appreciated from the fact that wind a little stronger than usual had covered the newly opened railway line with drifts of dust and sand to a depth of from three to four feet. There were twenty-seven of these drifts over a ten mile stretch of track and these had to be shovelled away before the train could proceed. Even the passengers helped in look-

ing for the track. Since the trains ran only twice a month, there was no danger of collision.

In considering these excessive effects of drought, it should be remembered that all the indigenous animals of Australia are soft footed and few of them gregarious in habit. The introduction of the sharp-hooved flocks and herds of sheep and cattle and the burrowing rabbit has meant not only the cutting up of the surface of the soil but the destruction of the native herbage down to its very roots. Then when one of these prolonged droughts occurs, the devastation of the country is complete. Even the mulga, that hardiest of desert acacias, dies out in many places. There is nothing to bind the surface soil together and when the wind storms and "willy-willies" or whirlwinds sweep across the plains the dust and sand is lifted in clouds. On several mornings while camped in the center, we awoke to find ourselves in a red fog. It was composed of extremely fine sand which had been carried into the upper air and had drifted several hundred miles across the continent.

This disintegration and wind erosion of the surface soil has proceeded so rapidly that a huge and increasing area of the country is covered with sand hills. One such area lies to the west of the railway line and another still vaster occupies what is now known as Simpson's Desert east of the MacDonnell ranges that run across Central Australia. Here some of the windrows of sand run without a break for one hundred miles, the whole area being four hundred miles in length. Station homesteads that stand in the way of the shifting dunes are eventually overwhelmed. Madigan,¹ who has reconnoitered this country by airplane as well as by car and camel, reports that some of the sand dunes are moving lengthwise. In one place, one of these drifts has interposed

¹ Madigan, C. T. *Central Australia*. Oxford University Press, 1936.

itself like a snake between the homestead buildings so that the occupants have laid down a wire netting track over a fifty foot dune between the kitchen and the sleeping quarters. It is virtually impossible to cross the sandy areas even by camels. Natives cannot subsist here, although they frequently live on the outskirts, making excursions into the sand hills to secure the peculiar plants and small animals that make these regions their home. Water, of course, is impossible to find. Further descriptions of this sandhill country will be found in a later chapter where the desert areas of Australia and South Africa are more specifically compared.

The enquirer who tries to draw conclusions as to the nature of Central Australia from looking at the map might easily be misled. Towards the southeast are represented lakes of considerable size, the most important of which are named Eyre, Torrens, Blanche and Frome. Of these the first two are of such size as to suggest inland seas. Nor is there any dearth of rivers. From the southwest corner of tropical Queensland, the map shows the Barcoo or Cooper's Creek and the Diamantina meandering across a thousand miles of country to empty themselves into this great lake region. From the northwest the more optimistic cartographers show the Finke River running another thousand mile course, issuing from the MacDonnell Ranges and emptying into Lake Eyre.

But ill-fated indeed would be the traveller who relied on these lakes and rivers to mean what they do in other countries. The Finke does rise in the MacDonnells and perhaps at some former period flowed into Lake Eyre, but as to this time the memory of man runneth not. In occasional wet years floods do sweep down its course, bearing on their frothy tides hundreds of the sun-dried carcasses of horses and cattle that have perished in a seven-year drought. But

in 1929 when I saw the Finke there was not a drop of surface water in eight hundred miles of its reputed course, except for deep pools at Glen Helen Gorge not far from its source in the ranges—and this water was too salt to drink.

As for the Barcoo and the Diamantina—these too may be floods of swirling brown water hundreds of yards wide, but for years at a time are merely dry winding depressions in the desert surface. After torrential rains at their source in distant Queensland, they flow slowly to the southwest filling many hundreds of clay pans and lagoons as they go. The Diamantina has the more defined channel and in the good years reaches and fills an immense depression named Goyder's Lagoon. From there the overflow collects into what is called the Warburton which sometimes reaches Lake Eyre. The Barcoo lies more to the east and when in flood must also fill its quota of hundreds of pans and depressions before it turns west towards Lake Eyre. Hence the flood waters that fall in Queensland may be two or three years on their way.

Lake Eyre at best is just a film of water a foot or two deep, and salt as the sea. When it dries the mud flats are a death trap for stray cattle and horses that might venture in after the salt weed that grows after the flood. Only the dingoes or wild dogs know the safe tracks between the heaps of decaying driftwood, and when the rabbits are plentiful, live there in great numbers.

To keep these destructive hordes from spreading into the settled areas, the New South Wales government has built a strong six foot fence of wire netting along the western boundary of its pastoral districts. This barrier is patrolled by men on camels, each man being assigned a twenty-four mile stretch to guard. Men and camels are dependent on the water from artesian wells sunk at intervals along the line.

The water comes bubbling to the surface from four thousand feet below, very hot and often charged with mineral salts. Some of these wells flow at the rate of a million gallons and more a day, but even so the water runs but a short distance from the bore before it is soaked up by the thirsty earth.

Before these wells were dug, the natives were dependent for existence during the dry years on their knowledge of the infrequent soakages and springs. Yet they managed to maintain themselves as permanent occupiers of this country. In the good seasons life is relatively easy. When rain falls, the growth of vegetation—except where it has been thoroughly eaten out by sheep or rabbits—is most extraordinary. The mulga puts out its fluffy golden balls, the needle bush blossoms with its pale, fragrant flowers, white daisies and bluebells carpet the ground. Animal life appears almost miraculously and is similarly abundant. But these are not the usual conditions. It is not against the times of plenty but against the extremes of deprivation that man must measure himself, and in this area, where the average rainfall is less than six inches and varies between one and twelve inches, the period of scarcity is inevitable. It is no wonder that the native seems improvident because there is no provision possible against a six years' drought. When the time of stress arrives, primitive man must live like the crows and dingoes—eat while he can, fatten for a time on the drought-stricken and enfeebled animals, and then subsist by hook or crook till the drought ends.

Lakes whose bounds are so uncertain that they can never be accurately mapped and whose greatest depths are a few inches covering a bottomless pit of mud; rivers which run without tributary feeders so far from their source that they take years to fill their channels; lonely flat-topped hills, the residual stumps of worn-down ranges; gibber plains, covered

with a jumbled or tessellated mass of fragments of desert sandstone or quartzite that once capped the hills and now forms a rough pavement, shining orange-red or purple in the light of the setting sun—such are the physical features of the southern and southeastern portion of this vast interior. In some of Nature's lighter moods it is beautiful, but for the most part it is a hopeless terrain, empty of life except for a few lizards and burrowing beetles. The sandhill country, though it lacks surface water, is even richer in animal and vegetable life.

As one nears the center of the continent the scene changes. The gibber plains and the flat topped hills are left behind and more definite ranges appear. Finally the eastern MacDonnells are seen to loom up ahead, the railway line heading for what is an apparently unbroken range rising abruptly two thousand feet above the surrounding country. A bend in the line, and there opens up the narrow level defile of Heavitree Gap, beyond which lies Alice Springs.

These gaps are perhaps the most characteristic feature of this central region. There are four main mountain ranges all roughly parallel—the MacDonnell, the James, the Waterhouse and the Krichauff ranges. For the most part, the streams, such as the Ellery, the Jay, the Finke and the Todd, rise on the northern side of these ranges and penetrate these lines of mountains in a succession of most picturesque gorges or gaps. For example, the Finke River rises near Mt. Sonder on the northern side and makes its way southward in apparent disregard of the mountain ranges that bar its way. After issuing from the last of three gaps it makes its way across the Missionaries Plain and then turning sharply near Hermannsburg Mission Station it cuts a grand series of gorges right through the highest part of the Krichauff Range.

The only explanation one can reach in considering these

narrow gaps is that the rivers are by far the most ancient things in this region and had determined their southward courses when the slope of the country was different and before the mountains rose to bar their way. Throughout this period of elevation the streams have continued to cut their way so that now the center is a switchback of steep ranges deeply scored by river valleys and gorges that pursue their way entirely unmindful of the general contour of the country. While these river valleys were being eroded, the region must surely have enjoyed a much more plenteous rainfall than at the present day.

As I saw it, the country was so desperately in the grip of the drought that we wondered how the natives outside the mission station managed to survive. There were three groups of aborigines, each under the leadership of an old man, eking out a bare living within a twenty mile radius of the mission. One group was on Ellery Creek, a second at Kooparilya Springs and a third on the Finke River near Glen Helen. The last was under the control of an old man named Lame Woppity, so called because he had been hamstrung in a fight with another native in his youth and had been lame ever since.

We made a trip through Woppity's territory and anything more hopeless looking would be hard to imagine. The mulga was dying or dead; the occasional desert oaks stood drooping in the hollows; the slopes of the foothills were grey and lifeless, and even the spinifex clumps were so dry that when touched with a match they literally exploded into flame. The ground was pulverized into dust, so burnt and barren that it seemed unbelievable that even a deluge could bring life to it again.

The cattle and horses that once grazed on these foothills had long since died. At one place where a little spring was

hidden in a gully, the bodies lay so thick that you could walk over them for fifty yards without putting foot to the ground. As the animals had grown weaker, they had been unable to feed far from the water, till at last they lay as they fell, unable to struggle farther. The carcasses were sun-dried and cured so that the skin held together like leather; you could take the whole bag of bones and stand it up against a tree in hideous imitation of the living animal.

It was indeed a place of death. The utter stillness of the scene may have done much to deepen the impression of lifelessness. This midwinter day was windless but even had there been a breeze I doubt if there was a leaf left to rustle. One listened in vain for a bird note, but even the crows and kites had long since died or departed. A turn in the gully cut off all outward view and the sun beating down strongly on this windless hollow had drawn from the dead bodies all semblance of moisture, leaving them so sapless that they seemed beyond decay. To all appearances, they might have lain there sixty years instead of six.

A few miles away beside the bed of the Finke we suddenly came upon an aboriginal hunting assiduously for food. He was turning over the stones, pushing over the dried mulga bushes, breaking the brittle roots in search of grubs, his roving eyes seeking any movement that might betray the presence of a stray lizard, beetle, or edible ant. He was searching so eagerly that at times he almost ran. He knew one word of pidgin English. Putting his hand on his sunken abdomen he would say, "Hongry! Hongry!" We were able to give him the remains of our lunch and he tucked the little package under the hair-string belt that held his boomerang and went on with his hunting. This food would be carried with whatever else he gathered and would be added to the common store which at nightfall would be divided by Wop-

pity among the group. They could look forward to one scanty meal each day, and the following dawn the people would again scatter, each individual foraging till dusk over his allotted territory.

A little spring in a rock hole not more than eighteen inches in diameter supplied the group with fresh water. From this hole a trickle made its way a few yards down the hillside, and round this spot the brush was green. Here had been built a tiny blind of bushes behind which during the early part of the night a young man crouched with spear poised in case an unwary rock wallaby might approach within range.

In comparison with these prolonged stretches of drought and scarcity, life in the occasional periods of plenty must seem luxurious, to be savored slowly and to the full. This may account for the seeming inactivity, the slow tempo of the native life when food is plentiful. At such times the camp is not early astir. If it be winter, the cold is often intense and the natives being entirely naked are loth to leave their fires, and huddle about them seeking warmth. When it is time to move, both men and women will carry a fire-stick and as they march take every opportunity to fire the grass and thus ameliorate the numbing winds that blow upon their naked bodies. But in the drought no such game-scaring actions are possible. With the first dawn the tiny night fires are deserted and men, women and children must begin the daily search for food.

In the most serious and protracted periods of aridity, tribal boundaries are neglected and large distances are covered in the struggle for subsistence. Then the Australian tribe becomes truly nomadic. While I was at Hermannsburg, a group of thirty-eight naked Luritcha came in from their home two hundred miles away to the southwest be-

yond the borders of another large salt marsh, Lake Amadeus. Great belts of almost impenetrable mulga scrub lay between, and to make this journey in safety meant that every available spring, rockhole, or soakage, no matter how tiny, must be known to the old men. Thus one recognizes the practical importance of the myths of the group for the routes of migration are also the historical pathways of the legendary ancestors or culture heroes of the tribe. When given paper and crayons by members of the Adelaide University expedition into these regions, the old men would spend hours drawing these chains of waterholes, calling each of them by name. Some of them may contain water and others may not, but the actual location of every possible watering place must be known. Thus in the memories of the old men the whole country is mapped out, and many of the tales told at tribal or totemic ceremonies serve to fixate this knowledge. For the white traveller these tiny stores of water would be quite inadequate. In many instances they consist of perhaps a gallon or two of water hidden at the bottom of a twisted funnel in the rock, the place often foul with the bodies of snakes or small marsupials that have fallen in and failed to extricate themselves; or it may be that all that is left is a little sand whose welcome dampness must be sucked off twigs that are thrust down to the bottom of the hole.

One such spring our aboriginal guide led us to when we were making a short camel trip into the Krichauff Ranges. He had never visited the place but received such accurate directions from the old men that he was able to find it. The only sign of the spring was a little damp earth a yard or two square in the bottom of a wide gully. Scraping away the dirt, we came to the rock beneath and here a film of free water could be seen oozing over its surface. By making a

little dam of earth and waiting an hour we were able to secure a pannikin full of extremely dirty water. But such a find would have meant life to an aboriginal family on the march. Here they would wait patiently until the *pitchis* or wooden receptacles, hollowed out from the soft wood of the bean tree, could be filled, the top strewn over with grass to prevent the precious fluid from spilling while being carried on the women's heads to the next halting place.

When even these supplies fail, the native can sometimes get water from the roots of certain trees. Those trees that are water-bearing are unerringly picked out, the long roots followed and pulled up, cut into sections and allowed to drain into a *pitchi*. In this way a quart or two of watery sap may be collected. At other times a cup of water may be squeezed out of the body of a frog, which burrows down a foot below the surface of a clay pan.

These conditions are not confined to certain districts but are to be found over the immense area of this Central Australian country. I did not travel to the east of Alice Springs, but there also the difficulties of existence in the dry seasons are no less serious. Here is an apt description of this eastern area of the MacDonnell Ranges: "Velveted over with spinifex, rising as high as 3500 feet, and crested with the shining white of quartz blows with rifts and runnels of quartz those hills are a dream and a nightmare—a horror of thirst, with little water save when the big rains tumble tons of stones along the gullies, and when creeks are twenty feet deep, but away in a week."²

This, then, is a land of extremes—of brimming lakes or dusty clay pans, of carpets of flowers or dry spiky spinifex, of plenty or desolation. The day temperature in midwinter may range as high as 95° in the shade and at night fall to

² Hill, Ernestine, *Walkabout*, July, 1935.

20°, so that your waterbags are frozen solid. In summer the glass may reach as high as 120°, while temperatures of from 100° to 115° are by no means uncommon.

As though to make the general aridity of the scene more striking, there is one spot in Central Australia which may be classed as an oasis. This is the famed Palm Valley. We took camels from the mission at Hermannsburg and entered the Finke or Larapinta Gorge, following its serpentine windings for about sixteen or twenty miles. The rough track sidles along between towering red sandstone walls, crossing and recrossing the sandy bed of the Finke and climbing wherever possible on to the low benches on each side. At times the gorge contracts so narrowly that it seems to have ended until a turn reveals an outlet: at others tributary canyons come in on either side and allow a wider breathing space. But even this sheltered spot had felt the clutch of the drought. At the place where the Palm Valley Creek comes into the main gorge there was once a wonderful group of *Livistonia mariae* palms, from which Palm Valley takes its name. But the deep waterhole over which they once hung had gone dry and was filled with sand so that the palms had nearly all perished. Back a few miles up the creek where Mt. Hermannsburg interposes its bulk between the oasis and the drying northerly winds, the stream bed curves under its shelter and the palms still flourish among a quite luxurious undergrowth. Here once more we heard the welcome sound of bird notes, and saw the tracks of dingoes and wallabies thickly pitting the damp sand about the waterholes. We camped at night under the very tree where the *lartna* or circumcision ceremony of the local group used to be performed. But now the place, though habitable, is quite deserted, the last members of the totemic clan that owned this country having passed away.

The silence and the solitude of Palm Valley is rarely broken by aboriginal visits. The place was doubly protected. It was evidently not in the course of the mythical wanderings of the ancestors of any of the other groups represented at Hermannsburg and hence would have no legendary significance: in the second place, the place was guarded by the spirits of the dead, in whom were still vested the hunting rights of this region.

The respect which the savage has for the rights of totemic groups other than his own has decided effects. In ordinary times it results in the elimination of competition among tribes for favored hunting territory but in the times of scarcity it makes the struggle for existence all the keener. Local groups then, as we pointed out, become nomadic, but the course of their migration will follow along the historical or legendary lines of the wanderings of their "alcheringa" or dreamtime ancestors, passing along a definite chain of water-holes. Only when tribal organization is breaking down will the natives move over into the territory of groups who have no living representatives. This firm anchoring of groups in unfavorable localities has been a factor in keeping population down to low limits. On the other hand, it has an important effect in preventing the biological balance from being too seriously disturbed over a given area. After the drought is broken, a place like Palm Valley becomes a focal point for the redistribution of game throughout the depleted areas. Were the natives to crowd into such spots as Palm Valley, this would not be the case, so that the preservation of the game in sequestered places is an important factor in the rapid recovery of the country as regards native food supplies after a drought, a feature which has impressed every observer. This change in the general appearance of the scene seems almost magical. The grass though never thick

is knee high; the slopes of the hills are bright with flowers; the waterholes fill and in a little while are stocked with small fish and other kinds of aquatic life the birds reappear and all the marsupials large and small are again in evidence.

The traveller in such a year will have an entirely wrong impression of the conditions of life in this country, nor will he gather, from those inhabitants who are left, any correction of his optimism. The situation is excellently summed up by Madigan in the concluding paragraph of his book on Central Australia.

"One good rain and the seven lean years are forgotten. Therein lies the lure and the fascination of the country. The droughts last for long series of years in those vast areas, when the traveller is oppressed with the hopelessness of it all, and there is nothing so welcome as the shadow of a great rock in a weary land. The waters dry up, the stock are dying, the wild birds and animals are gone, the sand is piling round the useless stockyards, when suddenly the rain comes, and the cycle ends. Who so poor in spirit that he would call it the beginning of a new cycle of drought, and not the end of the old? The whole face of the country is magically transformed, the grass springs up, the remaining cattle revive, the birds return, and the voice of the turtle is heard in our land."

This is Central Australia from the viewpoint of the white settler. It is sufficient to say that the civilized pioneer is sometimes driven off discouraged, never to return; but the native inhabitants unless killed or dispersed by white competition, remain. From the aboriginal you will get no reactions of hopelessness. He and his kind have been equal to these conditions for centuries.

CHAPTER IV

HISTORY OF THE BUSHMEN

IN one respect the center of Australia and the center of the subcontinent of South Africa are alike—they are both comparatively empty of white inhabitants. As regards the two areas, less is generally known of the Kalahari and its native inhabitants, probably because there is less to know. In the next place, with little incentive to gather information, there have been fewer informers. The seasons in the Kalahari are never so severe as in Central Australia, and never so good, but in the absence of surface water there is nothing to attract the pastoralist. Furthermore, the Kalahari sands do not seem to conceal beneath them mineral-bearing rocks of any value, while in the Central Australian region the possibility of the discovery of gold or other precious metals is a constant lure to the prospector. From the anthropological point of view, the Bushmen seem less important than the Australians, mainly because they are a dying remnant and the time for research among them has almost gone by. Hence, for these various reasons, the Kalahari, though it less deserves the name of desert than several hundred thousand square miles of Central Australia, has had less written about it in recent years than the latter region.

For first hand description of the Kalahari proper, the reader must rely most on the pages of such travellers as Galton, Andersson, Baines, Chapman, and Livingstone, all of whom wrote nearly eighty years ago. Of the more modern

travellers, Passarge wrote thirty years ago, while recent writers such as Dornan and Schwarz confined their observations to the northern Kalahari, which is in no sense of the word a desert. As for the people of South Africa itself, they seem to be too pre-occupied with the problem of the native in their midst to concern themselves with the almost extinct aborigines of the distant Kalahari. Though Schapera has published an excellent compilation of most that has been written of these people, he does not provide any picture of them against their natural background. Yet for the purposes of this study such a picture seems necessary, a view that will show the Bushmen in their own setting. I have endeavored to present this view by means of a narrative, which is one of travel but not of adventure.¹ In this way it is hoped that the reader will be prepared for the more detailed comparison of the Central Australian and Kalahari environments which is to follow. If excuse for this endeavor to picture the natural habitat of the Bushmen is needed, it may be found in the fact that such a picture is difficult to obtain from the available literature. Before proceeding with this narrative, however, it may be advisable to give some passing attention to the historical background of these people.

Though Bushmen are now only to be found in the Kalahari and the contiguous areas of Ngamiland and Southwest Africa, three hundred years ago their territory took in almost the whole of the subcontinent. Though there is no direct historical record, there is excellent ground for the belief that at one time they inhabited northern and central Africa as well.

Schwarz has suggested that the Bushmen were known to

¹ This was the plan followed in *The Psychology of a Primitive People*, which deals with the Australian aborigines and their habitat.

the Egyptians of pre-dynastic times. He quotes Budge as authority for the statement that an inscription on the tomb of Her-Khuf, a governor of an Egyptian province, tells of his excursion to the south where he obtained a pigmy for presentation to the reigning Pharaoh. Schwarz also states that statuettes showing steatopygia, that remarkable development of the buttocks characteristic of the Bushmen and Hottentots, have been found in Egypt. He also states that a rock engraving discovered at the Owenat Oasis in the Egyptian Sudan represents a Bushman shooting at an ostrich with bow and arrow.²

Be this as it may, there is ample evidence that a people with culture similar to that of the Bushmen once roamed over northern Africa. The stone culture called the Wilton culture, which seems to be most definitely associated with Bushmen paintings, consists largely of pigmy tools. Implements exactly similar are, according to Burkitt, also found in Uganda. The cave paintings which are found all over South Africa are, in subject and execution, much like those found in caves and rock shelters of eastern Spain. These latter can be linked up with similar paintings to be seen in northern Africa so that cultural contact of the African people with those of southern Europe may be assumed.³

The evidence of prehistoric times, based partly on skeletal material, points to the fact that the Bushmen may not have been the original inhabitants of South Africa but were themselves invaders, entering from the north and establishing contact with a stone age people already living there. The stone implements of these supposedly earliest inhabitants of South Africa were of the type known as lower Palaeolithic,

² Schwarz, E. H. L. *The Kalahari and Its Native Races*, p. 159. Idem, *Science Progress*, Vol. 1, July 1926.

³ Burkitt, W. G., *South African Past in Stone and Paint*, p. 168 et seq.

which was characterized by the development of large hand axes or *coups de poing* with which were also associated variants in the shape of stone cleavers suitable for hafting. Though the time sequence is by no means certain, this culture was in many respects not apparently continuous with that of the Bushmen and is hence considered to be the work of the earlier inhabitants. The work of Goodwin has added materially to our knowledge of these industries.

When the Bushmen were unable to find caves or rock shelters to decorate with paintings, they engraved the surfaces of boulders with outlines of animal forms, in some of which the bodies were rather rudely ornamented with pits like pock marks. In the best examples the forms were sculptured in partial bas-relief. This gave rise to the notion, adopted by Stow, that there were two divisions of Bushmen, sculptors and painters, but as a matter of fact wherever there were suitable caves, paintings were executed. Rock engravings are found all through northern Africa, indicating former occupancy by the Bushmen and a southern migration.

But whether or not these people were the original inhabitants of South Africa, it is evident that they occupied this portion of the continent for a very lengthy period of time. As Stow points out, it would hardly have been possible, in recent times, for the Bushmen to force their way through the numerous and warlike tribes of Bantu blood, who have long occupied central Africa. The assumption is that they reached the tip of the continent far in advance of the later Bantu invaders.

In comparing Australians and Bushmen, it may be taken for granted that each race inhabited without competition an immense area for a very long period. Each had space and time in which to develop its distinctive culture. The Aus-

tralians lived unmolested until the arrival of the whites one hundred and fifty years ago. The Bushmen sustained no serious pressure from outside peoples until the Bantu invasion, possibly four or five hundred years ago.

It is true that the Bushmen shared the country with the Hottentots but there was ample room for both peoples. The latter were pastoralists, carrying on at the same time a little primitive agriculture; the former were hunters and gatherers dependent on the veldt for their subsistence. There was therefore little competition between the two groups. Culturally speaking, the Hottentots were at such a low level that the Bushmen had little to learn from them. Some writers believe that similarities of culture indicate that both peoples belong to the same ethnic stock, for which the name *Khoisan* has been suggested by Schultze and adopted by Schapera. Because of the differences both physical and cultural between them, it would seem better to regard Bushmen and Hottentots as originally constituting two distinct racial strains. The similarities in language, religious ideas and physical characters can be easily understood on the basis of intermixture and social contact; the differences could only be accounted for by the assumption of two distinct racial stocks.

The fact that the Bushmen were found scattered all over the continent, inhabiting the more arid as well as the favored parts is no proof of external pressure. We have already seen how a people like the Australians spread over the desert regions and how groups came to identify themselves and their history with their local habitations. The Bushmen also became attached to their own hunting territories and rarely moved out except when forced to do so.

If they entered South Africa originally to escape the pressure from the incoming Bantu, their migration did not

save them, for within the last five hundred years contact between the two peoples has been established at many points. Apparently the first Bantu invaders are now represented by the Bakalaghadi. These are people living on the fringe of the desert and as their name is also spelled Bakalahari, they have given the region its name. These people have retained the Bantu custom of owning cattle, practise a simple agriculture, speak Sechuana, and have mingled their blood freely with that of their neighbors, the Bushmen.

Among the other early arrivals were the Makalanga who settled in the center of southern Rhodesia and by some are credited with building the Zimbabwe ruins. Then followed fierce tribes of Zulu blood, Abambo and Amazimbo, forerunners of hordes who passed down the central migratory corridor and made their way towards the south and east. An interesting fact is that when the wave of Zulu invasion spent itself, there was a backwash which carried some of these people, such as the Angoni and Makalolo, right back to the shores of Lake Nyassa and the Zambezi.

Amazimbo and Abambo, however, represented merely the first lapping over the spillway. Then followed the flood. Barotse, Bavenda, Bathonga, Bapedi, Bakwena had erupted on to the central highlands only to be thrust out in their turn towards the periphery of these regions by conquering hordes of the fiercer Zulus and Matabele. The setting up of a terrible military domination by Tchaka and the ensuing Zulu wars, estimated to have cost a million lives, resulted in waves of diffusion of tribes either escaping from or extending the Zulu warlike system. But whether these wandering hordes were Basuto or Angoni, Matabele or Makalolo, the Bushmen received short shrift at their hands. Because the hunting people speared the cattle that kept the game from the springs, or because they occasionally raided a cattle post,

the Bantu tribes declared a bitter war of extermination against the aborigines. The contest was an unequal one. Against the oxhide shields, the throwing assegais, the short, broad-bladed stabbing spears, and the vast numbers of their enemies, the Bushmen could oppose only their little poisoned arrows, backed up by unflinching courage and incomparable bushcraft.

The battles that ensued did not go entirely unrecorded. In the periods of leisure or while hiding from their enemies the Bushmen employed their artistic skill in depicting on the walls of their shelters incidents from this long warfare. In one painting Bushmen appear, carrying out a cattle raid. With spears in hand and bows and arrows tied across their backs, the raiders are shown chasing the red and white Kafir cattle while a rear guard holds back the pursuers. In a cave in the Brakfontein Ridge in the Koesberg district is to be seen a most animated battle scene between Zulus and Bushmen. The former are hurling their assegais and seeking to hide themselves behind their oval shields, but the battle is going against them. Dozens of arrows are shown in flight and the quivers of some of the Bushmen are still full. From the wounded Zulus, great streams of blood are seen issuing. In Stow's explanation of the picture he mentions the Kafirs' habit of incising their wounds so deeply in order to avoid the agonizing effects of the arrow poison, so that they often bled to death.

In still another battle scene the Zulus are depicted as about three times the size of their Bushmen opponents, the artist's evident intention being thus to emphasize the odds against his people. The stolen oxen are represented in their natural colors and the execution is remarkably good. In this fight the advantage lies with the Zulus, for the quivers of the bowmen are nearly empty and several have fallen transfixed

by their enemies' spears. It is noteworthy that the artist always showed these battles as though viewed from above, representing them as a series of individual combats, in this way no doubt satisfying the self-esteem of the participants.

Defeat must have been the outcome of many a struggle, for the hunters could hardly sustain an open battle with their savage enemies. So they were eventually driven from the open country to the shelter of the kloofs and caverns of the rugged mountains. With a cave at his back and a broken rock-fall at his feet, the Bushman was a most formidable antagonist. Carrying his skin quiver full, and with his spare arrows filleted around his head, he could put up a most desperate resistance against superior numbers. Fighting in his own terrain, it is doubtful whether the Bushman would ever have been entirely dislodged had it not been that he incurred the much more terrible and implacable hatred of the white invaders also. Pressed upon by the Kafirs on one side and the Dutch and British on the other, he was caught between the upper and the nether millstones.

To the Dutch, when they formed their first settlement at Der Kaap in 1652, this land must have seemed savage and untamed. Imagination was not needed to fill it with strange and terrifying beasts. The behemoth of Scripture and the legendary unicorn were both represented here. Lions and leopards ranged up to the very doors of the settlement. At the little Salt River, which empties itself into Table Bay just a mile or so from Cape Town, the scared townsfolk once witnessed a battle royal between elephants and rhinoceros. On one occasion the governor sent a file of soldiers from the fort to dispatch a rhino which was bogged in a quagmire. Finding their musket balls unable to pierce its tough hide, they returned to the fort to procure an axe to cut an opening in its side so that their bullets could reach a vital spot. In

1685 Van der Stael, the Dutch governor, had his carriage upset by one of these charging monsters.

It is little wonder that to burghers fresh from the quiet hearths of Holland, the people who dwelt on familiar terms with such dreadful creatures must have seemed as savage as the land itself. As the settlers gained courage enough to move from under the guns of the Castle, they built themselves strong houses, surrounding them with high walls of stone. Some of these old farms are still to be seen, with the cattle barns on one side of the thick walled enclosure, the slave pens on the other. The walls served to keep the slaves in and the lions and the Bushmen out.

But use soon bred hardihood and disregard for these new dangers. Against all the wishes and commands of the officials of the Dutch East India Company, the burghers began to spread further afield. They were strictly forbidden to barter cattle with the Hottentots, and in order to circumvent the officials' trading monopolies and at the same time to escape their irksome supervision, the settlers moved further and further into the veldt.

Under these circumstances it was inevitable that a clash should ensue with the original owners of the soil. The Bushmen soon found their best springs or "fountains" preempted, the water fenced, and the native game killed or driven off. The only private ownership in the veldt that the Bushmen knew was the right of each family to the permanent waterholes or springs and to all the game that came to drink there. When these rights were so highhandedly overridden, the hunters revenged themselves by spearing this new kind of lethargic, stupid game, the settlers' cattle. Hot with anger at what seemed to them a wanton offence, the burghers shot the Bushmen down with no more compunction than if they had been vermin. Native reprisals followed and thus

began a war of extermination, waged with countless cruelties and hideous outrages on one side or the other. How the whites regarded their troublesome foes may be gauged by a quotation from Stow: ⁴

“The Bushmen of South Africa have been described by their enemies, not only as being ‘the lowest of the low’ but the most treacherous, vindictive, and untameable savages on the face of the earth; a race devoid of all generous impulses, and little removed from the wild beasts with which they associated, one only fitted to be exterminated like noxious vermin, as a blot upon nature, upon whom kindness and forbearance were equally misplaced and thrown away.”

It may be remarked that quite similar opinions of the Australian aborigines have been expressed by settlers in the wilder parts of that continent. It has often been said that it is never safe to allow an aboriginal, however friendly, to walk behind you in case an uncontrollable killing instinct should seize upon him. As time has gone on, however, the distrust and hatred of the aborigines has been somewhat tempered by the fact that no campaign of extermination has been necessary, a more peaceful but certain process of dispossession and gradual extinction having been all that was necessary in their case.

Perhaps if the whites in South Africa had bided their time, starvation would have served their purpose equally well, for their occupancy has changed the face of the country completely. You may leave the pleasant flower-filled Cape Peninsula and enter the wide kloof that leads through the first inland barrier, the bare Hex River Mountains; you may cross the blasted heath of the Karroos, Little and Great; you may travel the sweeping uplands of the high veldt, but you will pass through a land singularly empty. Of the wild

⁴ Stow, G. W., *Native Races of South Africa*. London, 1905.

life that once so impressed the traveller with its abundance, nothing remains. No man will ever again see the vast numbers of springbok, estimated by Livingstone at forty thousand in a single herd, that came out of the Kalahari, covering the plains as far as the eye could see and making the landscape quiver with their tossing heads and horns as they moved and fed. Far removed now are behemoth and the unicorn, and even the lion is extinct south of the Orange and the Vaal. The uncropped grass, almost waist high, bleaches on the wide vleis between the distant kopjes, or on the windless nights of the dry season burns on a wide front like the campfires along a long line of cantonments. The flocks and herds of settlers and Kafirs are lost to sight in these immense distances. At intervals one comes across a few long-horned cattle or fat-tailed sheep tended by native herd boys, but for the most part the land is empty. To those whose memories go back to the time when the traveller's wagons outspanned within sight of numerous herds of game, the present prospect must seem a very tame and rather sad one. Perhaps, had they been left alone, the Bushmen would have followed the game into extinction.

That they were able to survive, even as scattered remnants, for one hundred and fifty years, against the combined enmity of Bantu, Boer, and Briton speaks volumes for their courage and their knowledge of the mountain fastnesses with all the possibilities of hiding or defence. The backbone of this country is an exceedingly rugged one; the ranges are often bare rock scored by deep kloofs or faced with precipices. One does not need to understand Dutch to appreciate the significance of such harsh terms as *krantz* or *kloof*, or proper names such as Stormberg, Roggeveld, Sneeuwberg and Drakensberg. These are no mildly sculptured, softly rounded uplands, but rock-faced mountain

chains. Here and there, under the eaves of huge overhanging cliffs, chambered deeply in the rim-rock or hidden at the heads of gorges, are caves that the Dutch commandos found it hard to beleaguer, and in these the Bushmen made their last stand. Those who wish to realize the difficulties of warfare in this country should read Colonel Reitz' book *Commando*, though it describes, not the sufferings of the Bushmen, but those of the Boers as they fought the British among the narrow defiles and steep ridges, where, one hundred years before, their grandsires hunted and harried their aboriginal enemies.

The description that Stow gives of these Bushman "wars" makes very painful reading. It is a tale of slaughter, many times wanton, in which neither man, woman nor child was spared; of broken faith and blackest treachery; of hapless wanderers on the veldt met by chance and ridden down like wild dogs. On the other side atrocities were not wanting. There were travellers attacked and slaughtered, helpless Dutch families captured in their isolated farms and put to all the tortures that savage ingenuity could devise; but with all this, the weight of mercilessness lay with the whites. Here is Stow's summary of the conflict:

"Suffice it to say that the Bushmen were pursued with relentless and almost savage ferocity. Clan after clan was annihilated, the men were shot down without mercy and the surviving women and children were dragged into a state worse than slavery. Sometimes they were destroyed in their caves, and no survivors were left; all, men, women and children, perished in a heap; and men, nominally Christian, boasted, as if they had been engaged in a meritorious act, of the active part they had taken in these scenes of slaughter."

It is evident that in this passage, the author is writing at the white heat of indignation, so that some over-statement

might be expected. But considering the brutality with which, at that time, white convicts, soldiers and sailors were punished, it is not hard to believe that people who were regarded as being at the level of wild beasts were thus cruelly treated.

Walker in his history of South Africa, mentions that in 1719 there was an isolated attempt made to conciliate the Bushmen, but this official pusillanimity aroused the wrath and suspicion of the Dutch frontiersmen. Fifty-six years afterwards there was a bitter campaign in which soldiers had to be sent to the help of the burghers in this very district. As a result of the campaign "prisoners were taken back to the Castle to be hanged or broken at the wheel, or to have their ankle sinews cut preparatory to serving life sentences." ⁵ By the beginning of the nineteenth century the extermination was almost complete, for Walker states, "There was little slaughter by Europeans after 1810." He concludes that the war was "a horrid, inconclusive business." It could hardly have been less horrid had extermination proceeded more quickly.

Stow is careful to point out that in this treatment of the Bushmen, blame falls upon the British as well as the Dutch. The courage and resource of the white pioneers deserve praise but some thought should be given to the fate of the pioneered. Alongside the honored graves of the empire builders might also be buried some of the human clay with which the empire was builded.

As regards the character of the Bushmen, there is no evidence that pacification by gentler means was impossible. When fairly treated they were kindly and faithful to their friends. It should not have been difficult to deal peacefully with people who were so merry hearted, that they could dance and sing on every possible occasion.

⁵ Walker, Eric A., *A History of South Africa*. London, 1928.

From the standpoint of the purposes of comparison of Bushmen and Australians, one question is important: Does not the fact that the former were able to put up such a formidable resistance to white encroachment for so long a period indicate that they either possessed greater numbers or a better tribal organization than they are usually credited with?

Stow mentions the prevalent belief that the Bushmen were without any form of government whatsoever, and proceeds to combat the notion. He speaks of large tribes under the authority of a chief who was paramount over a number of lesser chiefs, and whose "great place" was the rallying point for all the minor captains and their clans. As proof of numbers he tells of house foundations indicating large villages. There is, however, no evidence save the occurrence of stone implements that these were Bushman houses at all. Their huts are usually the most flimsy impermanent shelters. According to Stow's own informants, they made no attempt to make even their caves more habitable except by the scooping out of little hollows on the floor where individuals could coil themselves in sleep.

As for the organization of bands under a paramount chief, this certainly occurred under the stress of war but was hardly the usual condition. When the safety of the group was imperilled it was natural for the man of known fighting prowess to be accorded authority and leadership. There is little need to assume a much greater degree of social integration and tribal government than can be observed among the Bushmen today. The fact that the most rugged mountain districts were the natural rallying grounds of the hunted tribes would result in the coalescing of numerous clans under single leadership. Walker sums up the conditions of warfare thus:

"The Bushmen were a nuisance, but they were few and unable to make a determined stand till the 'seventies [1770], when they had been pushed back to the last great range of mountains which skirted the central plateau."

It was in the final campaign that a commando of two hundred and fifty men with Hottentot auxiliaries scoured three hundred miles of border country and evidently succeeded in cutting the Bushmen off from their mountain refuges. Five hundred of them were killed and two hundred and thirty-nine taken prisoners with the loss of one man killed in the commando. This does not look at all like well organized resistance.

The conclusion of the whole matter was the driving of the remnants of the Bushmen northward where they fell into the hands of the Griquas—the progeny of whites and Hottentots—by whom they were also slaughtered. North of the Orange they were harried by the Bechuana tribes until they were finally dispersed through the Kalahari. Westward, groups were pushed forward until they were hemmed in between the Namaquas on the south and the Damaras and the Ovambo on the north. At the present time they are probably most numerous along the western border of the Kalahari and also in the center of that so-called desert. There are also people called Bushmen who are found in the Okovango swamps, the Mababe Flats and to the north and east of Ngamiland up to the Southern Rhodesian border.

In comparing the Bushmen's resistance with that of the Australian aborigines, the different nature of the country to be defended should be taken into account. In Australia the mountains are mainly on the periphery of the continent, the plains inland. Once the coastal ranges were penetrated, there was no easily defensible hinterland as was the case in Africa. There is also the further consideration that the Bushmen

were already used to attacks from enemies, while the Australians had been for centuries undisturbed. Only in the mountainous parts of Arnhem Land and on the coasts of the Kimberley districts, where the natives were subject to contact and conflict with the Malays, did a warlike spirit prevail, and it is in precisely these regions that at the present time white domination of the aborigines is not complete. In other parts of Australia there was no place of retreat and those who stood their ground were peacefully but completely submerged.

Hence, the fact that the Bushmen withstood both whites and Kafirs for a lengthy period is hardly proof of their better social integration. Bleek, who continued Stow's studies and interpreted much of his work with regard to Bushman languages and art, summarizes their social conditions thus:

"Bushmen did not live together in large communities; their mode of life prevented that. The Colonial Bushmen in particular dwelt in very tiny family parties, two or three huts being usually found near one waterhole. There are no words for village and chief in their language. Ownership in drinking places went by inheritance; the land between certain springs and rivers belonged to one family, and all game drinking from these waters was their property. Though generally described as nomads, Bushmen did not move out of their own land unless forcefully driven out; but each family's territory was very large, and the owners migrated about within its borders following the game and the supplies of wild vegetable food, which has led Europeans to think that they had no homes. They had no fixed abodes but fixed drinking places, near which they erected small temporary rush huts in a different place each year, unless there happened to be a cave handy." ⁶

This description of the social condition of the Bushmen would fit excellently the life of the surviving people of that

⁶ Stow and Bleek. *Rock-Paintings in South Africa*, pp. xxi-xxii

race, and except for the fact that the drinking places in Central Australia are less evident than in the mountains of South Africa, and that droughts or other causes result in a greater degree of tribal cohesion, it would fit equally well the aborigines of Australia today.

CHAPTER V

SOUTH AFRICAN ENVIRONMENT

THE KALAHARI

THE Bushmen that survive today are to be found only in the Kalahari and along its borders. This area extends from the Orange River in the south to the Zambezi in the north, or between about the twenty-eighth and the seventeenth degrees of latitude. In physical characteristics the Northern Kalahari or Ngamiland differs considerably from the southern portion, and with its rivers and forests, certainly does not come under the description of desert country. Including those who live in Southwest Africa and the Northern Kalahari, the number of Bushmen is not great. Some years ago Schapera gave their number as being between six and seven thousand. Even this is probably an overestimate.

Whether the Bushmen of the Kalahari are the descendants of those who were driven across the Orange by Dutch commandos or are themselves the original inhabitants of this region is problematical. That they are so well adapted to living in the peculiar conditions existing there seems to indicate a very long experience of the desert and its ways. The full exploitation of its water and food supplies can have come about only through the experience of many generations. It is most probable that the Bushmen have lived there for many hundreds of years, though their numbers may have been augmented from time to time by the addition of bands escaping from pressure of enemies elsewhere.

The Bushmen of the Southern Kalahari are so similar in

physical features to the Cape Bushmen that Walker's description of the latter would apply equally well to them to-day. "Their neighbors may be pardoned," he writes, "for doubting whether they were quite human, for they were little sallow folk, barely five feet high, their heads adorned with pepper-corn tufts of hair and lobeless ears, their triangular, fox-like faces almost innocent of beards. Their twinkling eyes were deep-set beneath upright foreheads, their noses broad and low-rooted, their jaws projecting; and their slender limbs and tiny feet seemed ill-fitted to bear the protuberant stomachs of the men, or the pendulous breasts and fat buttocks of the women."¹

Many of those now included among the Bushmen who live in the Northern Kalahari would by no means answer this description. The term "Bushmen," as at present applied, denotes a way of living rather than a race; all those who are dependent entirely on the veldt or bush for their sustenance are so called. Hooton defines a race as "a great division of mankind, the members of which, though individually varying, are characterized as a group by a certain combination of morphological and metrical features, principally non-adaptive, which have been derived from their common descent."²

According to this definition the people now classed as Bushmen, because of their physical diversity, can hardly be considered as belonging to the one race. For example, von Luschan found the average height of the Southern Kalahari Bushmen to be four feet seven inches, while the Galikwe or Madenassena from the Northern Kalahari, according to Chapman, measured five feet ten inches. These latter, instead of being yellow brown in skin color, are decidedly

¹ Walker, Eric, *History of South Africa*, p. 34.

² Hooton, E. A., *Up From the Ape*, p. 397.

dark. The further north one travels the more the so-called Bushmen differ from the Cape Bushman type, for whom the racial name should be reserved.

To the rest Seiner has proposed applying the term "Bushman Bastards," but the name "Bushmanoid" would, I think, be less invidious, and equally descriptive. It is probably true to say that there are very few indeed of unmixed Bushman blood left and that the Southern Kalahari people are closest to the original stock. As a matter of fact, the Baka-laghadi, a rather degenerate Bantu people in the south, resemble the Bushmen more nearly and evidently have more Bushman blood than the Galikwe or even the Hiechware of the north. Because they have cattle and grow a little corn and a few melons, they are not, however, classed as Bushmen.

The other feature which these hunting peoples have in common, apart from a way of living, is the language, which is characterized by a number of clicks. Of these there are said to be seven in the Bushman tongue. There is the dental click whose symbol is /, and which is our click of annoyance; there are also to be distinguished the palatal click (!) made by withdrawing the tongue from the hard palate, producing a sound like a cork being drawn from a bottle; and the lateral click (/ /), the sound commonly made to encourage a horse. These three clicks have been incorporated into Zulu dialects, probably on account of contacts with Bushmen. There is also the cerebral click (‡), while a fifth is labial and is called the "kiss click." Besides these there are other unprintable sounds in the language described by one writer as "snores and warbles."

Though the various dialects have the same basis, they differ so much that a man from the south would not be understood by a Bushman, say, from the Mababe Flats, four

hundred miles north. A common language is no proof of community of blood, the physical similarities being much more important evidence.

Seeing that the Bushmen are so few in number and so widely scattered, any attempt to get into touch with them and judge their environment is naturally fraught with great difficulties. After various enquiries I found that the best approach for me to the Southern Kalahari was from the chief town of the Bakwena tribe, a place called Molepolole. I was fortunate indeed to get in touch with Mr. John Knobel, who has kept a trading store there for some years. He is of Dutch descent and speaks Sechuana, the language of the Bakwena and Bakalaghadi with whom the Bushmen were in contact. Mr. Knobel has made several expeditions into the Southern Kalahari, and very kindly agreed to accompany me as guide and interpreter. Our original plan was to cross the desert from Molepolole to Ghanzi where there is a Boer settlement from which a road runs west to Windhoek and another track of doubtful passability to Maun, the administrative center of Ngamiland. There was a track of some kind for about one hundred and fifty miles west from Molepolole but for the remaining half of the distance we should have to run our car across the untracked veldt. On the way I expected to get into touch with Bushmen groups wherever possible and come out from the Kalahari, either by way of Windhoek or Maun. As will be seen this plan had to be modified.

Having secured a covered Chevrolet delivery truck at Durban, I drove about six hundred miles to Mafeking, stopping enroute at Johannesburg to purchase supplies and equip our car for the desert journey. As regards these preparations, the most important items were the purchase of the largest sized tires possible and the reënforcement of the

springs. Two twenty gallon cans were included for the carrying of water and these together with some forty gallons of petrol or gasoline in drums, three months' supplies of food, instruments, and the camping and personal outfits of three men made a heavy load. Mr. Knobel, whom we met at Mafeking, was somewhat dubious about our chances of crossing the Kalahari with a single car.

These doubts were confirmed by Colonel Rey, the administrator of the Bechuanaland Protectorate, who not only gave us permission to enter the Kalahari but also to shoot game to attract the natives to our camps. He also gave me a letter addressed to all his resident magistrates, stating that the expedition was "proceeding with the full support of the Government." He also presented me with a set of large maps which though not particularly accurate were useful at times. These were the best to be had, although at times somewhat misleading. For example, at one place there was marked "Government Bore Hole Water." This was at least three-fourths true. The Government had put down a bore at this spot but they did not find any water.

The first hundred miles of travel along the borders of the Kalahari was definitely pleasurable. The track wound about the thorn thickets, mounted little red clay rises and dipped into sandy hollows. The clear skies and the light breezes of an African midwinter day, the camel thorn trees standing singly on the rises, looking, with their close cropped level tops, like ragged umbrellas blown inside out; the meerkats scurrying for their burrows at the noise of the car; the Kalahari pheasants each with its brood of young running across the track; the startled flights of long-tailed weaver birds, and the glossy starlings of unbelievably metallic color and sheen; the Go-away birds with the petulant, spoilt child's cry that gives them their name—all these combined to make

up a scene most interesting to the traveller, but which probably only those born in Africa can fully appreciate.

For one who had just set foot in the country, the illimitability of the place made its appeal. Away to the west the sun was dipping beyond the Kanye hills that edged the vast Kalahari sands. The very track we travelled wound on to Bulawayo, to the Zambezi, to Tanganyika and a couple of thousand miles beyond. Nor was human interest lacking. The Baralong or Bakwena children, who opened the gates for us and stood with two hands cupped in courteous acknowledgment of even the smallest gift we could bestow, were the descendants of the people among whom Livingstone first labored. Over to the east were the Lobatsi hills, their flanks wooded and their summits surmounted by granite boulders, where the leopards still have their lairs. It was past these hills that the explorer made his first journeys into unknown Africa and near-by was the mission station which he founded as the base for his first great expeditions. Everywhere were natives walking, perhaps going about their business, or merely going.

This, too, was country replete with the romance of the great hunting days of Africa. As we left Gaberones, a station on the railway line to Bulawayo, and struck west along the thirty-six miles that took us to Molepolole, we were passing through what was once a famous game resort. Eighty years before our visit, two Englishmen here shot seventy-eight rhinos in a single season. Livingstone describes the *hopos* constructed by the natives—large stockades leading to great pits into which zebras, wildebeeste, impala, giraffes, and antelope were driven until the pits were filled with the bodies of the dead and dying. "It is a frightful scene," writes Livingstone. "The men wild with excitement, spear the lovely animals with delight; others of the poor creatures, borne

down by the weight of their dead and dying companions, every now and then make the whole mass heave in their smothering agonies." Such was the profusion of game that he speaks of shooting buffaloes from his doorstep at Kolobeng, just thirty miles away to the north.

How different would have been our journey at a time when any of these thickets we passed might have concealed elephant or rhinoceros or when the roaring of lions would have been heard anywhere along the trail. The dark range of hills to the southeast of our track still harbors the kudu, but these together with the steenbok and duiker, troops of baboons and an occasional leopard are almost the sole representatives of the game so abundant before the coming of the white man.

In one respect, however, the *pax Britannica* has made life more secure in these regions. This is the country of the Bakwena—the people who dance to their totem, the crocodile—who had been driven by the fierce Matabele from their homes to the west on the Marico River. These hills were their last defence, to be clung to desperately, for beyond them lay only death in the desert. The track we followed was the path of many a raider, for Matabele impi and Boer commando came this way to attack the Bakwena and drive off their cattle. Anxious eyes often watched this trail, for those who came from the east seldom came in peace.

Molepolole, as we saw it next morning, is picturesquely situated among a jumble of low hills at the very edge of the desert. Mr. Knobel's house and store was built on a bench between one of these hills and a small gorge at its side. The hill was thinly wooded and covered with large granite boulders, among which a crowd of baboons found shelter, descending occasionally to raid the papayas in the trader's garden. Leopards also have their haunts in these hills, and

periodically, when they take to cattle-killing, are hunted by the natives. More rapid in their movements than the lion and more cunning in their choice of lairs and hiding places in rough country, leopards have survived where the king of beasts has become extinct.

Molepolole itself deserves a word of description as a typical Bechuana town. It took its name from Lepolole, a cavern very much dreaded by the natives who believed that no man who had entered it ever came out alive. Livingstone not only astounded the natives by exploring it, but shocked them by persuading Sechele, their chief, to accompany him. Though the town is said to contain ten thousand inhabitants, it is built without order or streets. It is a loosely knit conglomeration of kraals, each consisting of a little group of round mud-built houses topped with conical roofs of thatch and surrounded with a five foot, solidly built wall which serves to emphasize its isolation from other kraals.

For the most part, the town lay quiet in the African sunlight; no crowds, no cries of children, no hurry or bustle of going to and fro. Each kraal seemed self-contained, and whatever currents of life there were flowed unseen behind its mud walls. Many of the people were absent on their farms that might lie twenty miles distant.

Bechuana history, like their towns, seems to have but little coherence. Their social organization is so loosely knit that the tendency has been always for groups or subtribes to hive off by themselves under the leadership of some chief's brother or younger son.

These Bakwena, like the other Bantu on the fringe of the desert, are invaders who were themselves refugees. Moselekatzi, chief of the Matabele, was their scourge and to escape his merciless raids, the Bakwena first moved westward from their homes near the Marico and Crocodile rivers, making

their chief town first at Shoshong, then at Kolobeng and finally at Molepolole or Litubaruba, as it was called in Livingston's day. The Makalolo or Mantatees journeying north to the Zambezi attacked them and later still the Boers were at enmity with them. In their migration westward the Bakwena dispossessed the Bakalaghadi, driving them into the desert where the latter established themselves among the Bushmen, whom they brought under nominal subjection.

From Molepolole we followed a trail which was cut deeply into the sand, requiring the utmost skill in driving the truck so as to "half-spoor" the track. This consists in keeping one wheel just outside the deep rut, skirting the brush, and when a tree came too close, in angling swiftly across the track to get the wheels running on the edge of the brush on the other side. A moment's loss of steering control, and the wheels slip into the deep sand. Then follows a long painful grind in low gear until an opportunity occurs to sidle out of the rut and to half-spoor in second speed again. Fortunately, for the first three days of our trip we were accompanied by Louis Knobel, a most experienced desert driver. We had to admire his skill in keeping up speed, dodging and twisting and taking all kinds of chances of running into stumps or thorn trees, but keeping going at all costs.

Our progress, hour after hour, brought views of singular sameness. Dry spears of grass, making up in height what they lacked in spread and substance, provided a wash of dusty yellow, against which the dark masses of black thorn and other shrubbery were projected. Above this undergrowth, breaking the low skyline, stood the ragged array of the camel thorn trees. Such is the desert canvas, representative of many hundreds of weary Kalahari miles.

Nothing that grew in that region seemed to be without its thorns. We learned to know the hook-and-stick, so called

because at the base of each of its sharp spikes is a little barb that holds you while the thorn pierces; then there was the ape-thorn, a tree whose trunk was set about with saw teeth; the wait-a-bit, whose name is sufficiently descriptive; the sweet thorn with its myriad of white spines; the sickle thorn, and worst of all the black thorn, which literally seems to reach out and catch you as you pass. All these ring the desert in, as though on guard against the intruder.

It was easy to understand why the Kalahari became such a sanctuary for the hunted. It protects because it outdoes in savagery the enmity of the pursuer. Those who sought its refuge must accept its hazards—hunger, thirst, danger from wild beasts, loneliness. If these are preferred to the edge of the sword or subjection, then the refugee may survive, provided the desert itself does not cheat him. In the Southern Kalahari they still point out “the tree of the Boers,” where at the end of a one hundred and sixty mile “thirst” the emigrants found the clay pan empty of water, and perished in scores. This was one of the recorded tragedies; of the forgotten dead, whom death in the desert has overtaken, their name must be legion.

For many miles of our journey the desert seemed empty of life until suddenly the track began to sidle and twist into a hidden valley that was once an ancient river bed before the desiccation of the region was complete. Among the branches of the larger shade trees that covered the floor of the valley the birds reappeared—raucous voiced hornbills with yellow beaks, beautiful blue jays and running across the track a flock of two or three hundred guinea fowl. For nearly thirty miles we followed this valley, marked Letlaking on the map.

Some miles down it we came across the first human habitation, some kraals of the Bakalaghadi, each with its rough palisade of thorns to keep the lions and hyenas away. Just

a year before, this had been the scene of a lion hunt in which Knobel had participated.⁸ The animal had been wounded by a spring gun which had been set outside the kraal, where it had been killing cattle. The next morning he accompanied a party of native hunters which was hurriedly organized to follow the spoor.

When the signs indicated that they were nearing the animal the local witch doctor halted the party and went through a solemn ceremony, using his most potent charms to protect the men and bring them victory. Presently they sighted the lion and a lucky shot laid him low, to the immense joy of the hunters and the increased prestige of the medicine man.

Out of the valley our troubles recommenced. The sand was again very heavy and the radiator boiled, so that every fifteen minutes we had to stop to allow the engine to cool and to refill our radiator. Fortunately, we were able to replenish our supplies at Kudumalapshwe, a bore hole at the end of the valley.

The track had now become a mere trace and we were becoming a little anxious as to whether we were on the right course when just at evening we reached a cattle post. This was a corral or stockade of crooked poles, behind which we could see the wild eyes and tossing heads of the Bakalaghadi cattle. They crowded up to the fence clicking their horns and blowing and snuffing at us through the spaces between the poles.

Since there is practically no surface water on the veldt, it seemed strange that such herds could exist. The cattle, like the game and the people, must subsist on supplies of the tsama melon called *kgeme* by the Bechuana. These are round, about six inches in diameter, and grow thickly at

⁸ Schapera fortunately was also a member of this party and he has written for *Man* (Dec. 1932) a most interesting account of the hunt.

certain seasons on the veldt, remaining normally from one wet season to the next, a good crop occurring about every two years. The cattle and game break the rind with their hooves and eat the watery substance. There are two kinds of tsama, indistinguishable by appearance, the one palatable and the other extremely bitter.

After being guarded by the native boys all day on the veldt, the cattle are carefully herded into the stockade at night. These cattle constitute the wealth of the people and are rarely slaughtered or sold. They will be used as *bogadi* or bride-price. This, however, is more than a means of wife purchase but constitutes a guarantee that children will be forthcoming to build up the strength of the kraal. The cattle received as *bogadi* or *lobola*, as it is called elsewhere, will be used by the head of the family to secure a wife for the bride's brother. Should the wife prove sterile she may be divorced and the return of the cattle demanded. Usually, however, a younger sister is accepted as a second wife, thus avoiding the dislocation of the whole family economy which the return of the *bogadi* entails.

The boys who act as herders spend all their time on the veldt and while the cattle feed they practise bushcraft, setting springs and deadfalls for the smaller game, each bringing his catch to the campfire at night to be shared with his companions. Visits to the home kraals are infrequent until the younger boys are old enough to take their place.

As we drove up, the sun was setting. Just as in Old Testament days these youthful Davids set their watches against the lion and the wolf. The fires that cooked the evening meal and which would burn all night to scare away the beasts of prey were already lit, the thin blue smoke ascending in steady columns in the still desert air. From the dusk came the sound of a reed flute played by some youthful

musician. In this manner, for these many centuries past, day ends for primitive shepherds and cattle herders everywhere, the flocks and herds gathered from the wilderness, the gates barred with the heap of thorn bush, and the watch fires set and glowing through the night. But to us, the evening star, now faintly visible, was a warning. Motate Pan, our objective, still lay ten miles ahead and we must needs press on if we wished to make camp before darkness completely settled upon us.

CHAPTER VI

WILDERNESS TRAILS

MOTATE PAN was not to be found on the large scale maps which Colonel Rey had so kindly given us but is nevertheless an important landmark for the traveller. It merits a word of description also, because as a typical Kalahari clay pan it differs considerably from those found in Australia. In the latter country the pans are simply hollows which are periodically filled by drainage from the surrounding hills, the catchment area being too small to provide permanent water. Motate on the other hand is a shallow crater-like depression about a mile in diameter, with apparently little relation to the general contour and lines of drainage of the surrounding country. It has a grey-white surface covered with small fragments of limestone. When rain falls in sufficient quantities the drainage from the surrounding slopes is sufficient to cover the pan with a film of water, but as the clay bed is salt, the water is undrinkable. Because of the recurrent droughts, an Australian clay pan is usually bare of vegetation around its borders, whereas at Motate the thorn bush comes down to its very edge, the pan's white surface standing out in such strong contrast to the dark brown veldt that from a little distance it looks like water.

Even when dry it is a center of attraction for most of the wild life of the district. The surface was thickly pitted with the spoor of hartebeeste, wildebeeste, springbok, gemsbok and the lesser antelopes which come here to lick the salty surface. Singly, in pairs, or in small herds they make their

way thither, standing still for long periods cautiously watching, or sniffing the wind, ready at any sign of movement or strange scent to make off.

We had ample time to watch the movements of the game in the three days that we camped beside Motate. We made our camp about a third of a mile from the pan and as the natives told us that lions had not been seen nor heard for three months, we made no thorn bush fence but lay on the open veldt. Our nights were undisturbed except for the noisy yapping of some jackals and the peculiar whistling note of the bush knorhaan, a bird that is the self-appointed guardian of the veldt and gives warning of anything that moves.

At dawn each morning we were up and away, for unless we could get meat there was little chance of natives visiting our camp. The hunting also gave me an excellent opportunity to judge for myself the natural food resources of this part of the Kalahari. Our first glimpse of the pan at daylight showed that it was empty except for a herd of a dozen springbok grazing near the rim. In our chase after a wounded animal Louis shot and killed a steenbok, one of the smaller antelopes whose light yellow coat is slick and shining except at the moment of death, when it ruffles up like the hair of a dog.

We had just placed its body in the fork of a tree with a handkerchief hung close by to keep off the vultures, when we saw two Bakalaghadi approaching. They were travelling across the veldt on some affairs of their own, but these were not comparable in importance with the prospect of fresh meat, so they at once attached themselves to our service.

We had scarcely returned to camp and had breakfast than they were pointing out a herd of springbok grazing about a mile across the pan. My two companions set out after them, leaving me, not unwillingly, in camp. Shortly afterwards

two other natives arrived, apparently springing from nowhere. We learned afterwards that they had followed us from the cattle post we had passed the night before. These were also Bakalaghadi—small, and slightly built, but excellently proportioned, their high cheek bones, lighter color and peppercorn hair indicating a considerable mixture of Bushman blood. They were entirely naked except for a thin strap of ox-hide drawn between their thighs and attached to a string around their waists.

I was busily engaged loading my camera when a low hissing sound drew my attention. My visitors were both flat on the ground and there, within sixty yards of us, stood a fine springbok, standing broadside on, as though it had been running by when the sudden appearance of our camp had arrested its flight in curiosity or fear. By the time I had dropped the camera, seized a rifle and wrestled with an unfamiliar safety catch, the buck had run on without my firing a shot—to the evident disgust of the Bakalaghadi who could not understand my seeming paralysis.

Presently one seized my arm and pointed to a hartebeeste bull standing under a camel thorn tree perhaps five hundred yards away. It seemed to me most unlikely that we should ever get within shot of the beast but that I should make no attempt did not seem to enter the minds of the Bakalaghadi. They were off at once, crouched almost to the ground, their little black heads in some manner held almost erect at the level of the low brush, making most extraordinary progress. I had no recourse but to follow them, crawling on hands and knees, dragging a heavy rifle, with the hot Kalahari sun beating down on the back of my head, and doing my best to avoid the worst of the thorns and prickles that covered the ground. After two hundred yards of this painful progress, the Bakalaghadi in the meantime waiting impatiently for me

to catch up, I could crawl no further. When I could get the sweat out of my eyes and the kink out of my back I fired,—with the result that I had anticipated.

After our somewhat dispirited return to camp, I had a touching instance of Bakalaghadi faith in me as a sportsman. Their roving eyes had caught a hint of movement and after much pointing and jabbering in Sechuana ¹ I finally saw, about half a mile distant, some ostriches moving slowly down towards the pan. Fortunately, the real hunters of the party returned at this moment and since even ostrich meat would be welcome to the natives, they set out again—the result, one ostrich killed and another wounded. The latter was followed for a couple of miles in the hope of coming up with it and ending the slow agonies of death in the desert. However, it had gone too far, and as the hunters turned back the vultures were already following along the line taken by the wounded ostrich. These scavengers seem to have a most uncanny knowledge when an animal is near death or is badly disabled. When it finally falls they come dropping from all quarters of the sky.

The appearance of emptiness which the desert holds to the untrained eye is most deceptive, as the watchfulness of the natives showed. Nothing that moved within a mile's radius of the camp seemed to escape their notice, but by early afternoon even the hunters' zeal had abated. While we rested, one of the natives made a sortie on his own account to where he saw vultures hovering and returned with the report that jackals had been eating a duiker, which accounted for the chorus of the previous night. The kill suggested the proximity of lions but the boy insisted that there was no fresh spoor. Lions provided us with a topic of con-

¹ The common prefix for the name of a people is "Ba," for a language "Se." Thus the Basuto speak Sesuto, the Bechuana or Bachoana, Sechuana.

versation during lunch, the natives insisting that we should meet many lions later on. While we ate, the boys sliced tsama melon which provided both food and drink for them.

In the later afternoon we were again out on the veldt, but this is apparently the time when the wariness of the game reaches a maximum. Darkness is near and it behooves every creature on the veldt to scout its immediate surroundings most carefully, for it is at this time that the night's ambushes are laid. Ceaseless vigilance is the price of life in the Kalahari. There are but few deep thickets or secret coverts in the desert. To draw a wide circle of loneliness about you, and to hold everything at eye's length as it were—this is the desert system of defence. Wits must be kept at almost preternatural sharpness. In the middle of the day it is safe to drowse in the shade, but at the approach of evening the keen edge of sensitivity must not be dulled for an instant, nor any change in the furthest fringes of the scene go unremarked, or death may follow. The very largeness of the desert, threatening as it seems, provides the best protection. He travels furthest there who travels alone, provided that the appearance of emptiness does not bring a false sense of security. Any thickening of shadow, any darker curtain of brush may hide an enemy.

Under Louis Knobel's guidance we attempted to do a little night-ambushing ourselves. We crossed Motate and lay on our coats with flashlights and guns beside us waiting for game to come on to the pan. The place where we were was a little runway, a mere gutter which carried off the rain that fell in November storms. Now and then a whisper of wind crept over the veldt, setting a single leaf, overlooked by the locusts, rattling in little arpeggios of sound. The Southern Cross was high in the sky and the air was so

clear that a star shone through a bush, so low hung that it was hard to believe it was not a lantern or a distant camp-fire.

Though I had the excitement of wondering whether the lions might not choose this time to return to their old haunts, this was all, for when we turned on the flashlights, the pan was empty. Walking home, however, the brush seemed alive with lights, flitting here and there and bobbing around in most mysterious fashion. Our thoughts at once ran to lions or hyenas, but these were merely the eyes of springhares reflecting the light of our electric torches. Louis shot one for our inspection. It was a yellow haired, queer looking animal, lop-eared like a hare but with the long hind legs and hopping gait of a kangaroo. Springhares belong to the jerboa family and are plentiful in the Kalahari. Travelling at night there were many times when we thought they must be lions until their peculiar bobbing progress made their identification possible.

I have no intention of enlarging on our hunting experiences but mention them merely to emphasize the food resources available in what is called a desert and to point the contrast between Africa and Australia in this respect.

In our few days' stay, though we saw no large herds, game was often in evidence. At daybreak one morning we woke to see a half-dozen wildebeeste looming large and black against the lightening sky. Following these we came across and shot two out of seven red hartebeeste. Their rather glossy appearance is in strong contrast to the shaggy, heavy shouldered wildebeeste, whose forequarters look like a buffalo's and whose hindquarters are like a deer's. Returning to camp one evening, we surprised a gemsbok "bracking" on the pan, a splendid beast with long, slender backward curving horns over three feet in length and keen as scimitars. It is said

that the gemsbok occasionally puts up a good fight against a lion, the two animals, aggressor and victim, having been found dead together, the lion transfixed by the gemsbok's horns as the latter fell. It is a sturdily built animal, of a light fawn color, with a white stripe running along the belly and a similar mark on the face.

On one of our afternoon excursions into the veldt we came to a spot where every tree was loaded with vultures. The ground about was strewn with ostrich feathers evidently from the bird that had been wounded the day before. The vultures were so gorged with meat that they could hardly flap away while one late comer stood on what had been the dead creature's breastbone, its naked, evil-looking head and neck dipping and straightening as it tugged at a piece of gristle that the rest of the scavengers had overlooked.

The Bakalaghadi read for us, written in the sand, the story of the creature's race with death. There were the faltering tracks, the toes spread wide as the great bird summoned its remaining strength. Then came the fatal stumble, the forward lurch, and the jarring fall. Here the ground was furrowed, as with beating wings and convulsive kicks it had struggled a few yards further. We could imagine the slow final sinking of the head to the ground, and before the flesh had ceased to quiver the feast of the vultures had begun.

Where there is such a keen struggle for existence, dying must be of hourly occurrence, the most commonplace thing in the desert. Yet while death awaits on every hand there is no sense of morbidity, for when it comes it comes quickly. You are born, live life in its measure, and then the shears cut sharply and decisively. There is no room here for the weak or enfeebled or disabled. Even the leaves do not grow old on the branch, but are withered in the drought or devoured by the locusts, whose course in turn is soon ended.

Here is no indecent dodging, no cowardly twists nor evasions, no half-clinging to life.

So far we had seen nothing of the flesh-eaters, the beasts of prey; but next morning we experienced one of those dramatic surprises which the desert every now and then affords. We had struck camp and now with Mr. Knobel as guide—Louis having returned to Molepolole—we were on our way to our next stopping place at Khutse Pan, where the Bakalaghadi assured us we should find water, lions and Bushmen.

For a mile or so the track was fairly good and we picked our way between the stones, limestone accretions that here thickly studded the veldt. The morning sun stood high and the Kalahari had again taken on its appearance of midday emptiness, for the game had ceased feeding and were either lying down or standing in the mottled shade of some thin brush, immobilized into invisibility. As we slowed down to consider the track, a thicker blotch of shadow beneath a camel thorn tree seemed literally to explode into life and activity.

It was a pack of those scourges of the veldt, the Cape hunting dogs. So well had their dirty tan-colored bodies with black patches blended with the mosaic of light and shade that, had not our stopping scared them, we should have passed by without seeing them. They ran fifty yards and then curiosity mastered fear and they stopped to look at us. There were about a dozen of them, hulking brutes, prick-eared and with large slavering jaws. Fortunately rifles were within reach and before they were out of range we had dropped four of them.

We dragged the evil smelling carcasses together and looked them over. They were about the size of German police dogs but with much heavier forequarters, though like the hyena they fall away behind. None of the carnivores, not even the

lion, has a worse reputation as killers of game. Selous describes a sable antelope, usually a stark fighter, being chased by a single wild dog, which was hanging on to its quarry's flanks, every now and then jumping and snapping at it in its efforts to hamstring it by severing a leg tendon. Probably our killing of these four dogs more than made up for all the game we shot in the Kalahari.

The track we were following was a typical Kalahari trail, ill defined, partly scrub-covered and winding about as if doing its best to escape the deeper stretches of sand. It bore an air of uncertainty, as though it were not at all sure of a destination. And this was justified, for we knew that somewhere ahead, it first narrowed to a single path and then finally petered out in the desert. The game trails that crossed it on their way to the pan, though deeply cut, also had a false semblance of accustomed travel. Follow them back half a mile into the veldt and the thread of use becomes quickly unravelled into individual tracks that speedily are lost to view; and so perhaps it should be, for the essence of the desert is, as Lawrence of Arabia remarked, "the lonely moving individual, apart from the world as in a grave."

We were headed for Lunakie kraals where we intended to store some of our extra load. A careful check on our gasoline revealed that so far we were only making seven miles to the gallon, and at this rate we should, if everything went well, be probably thirty or forty miles short of our goal, and as the last two hundred miles would be across country that had never been traversed by a wheeled vehicle, everything might not go well. So we determined to push on to Khutse Pan fifty miles distant and then reconsider the position. We could, if need be, retrace our steps to Molepolole and reach Maun by the northern route where there was a road of sorts. It might be better to give heed to the Bechuana proverb

which says, "The long way round does not leave you benighted on the veldt."

Our progress was made more difficult and our mileage reduced by the fact that our radiator had harvested several acres of Bushman grass growing between the tracks, the seeds making a thick blanket that effectively cut off the air circulation. With a following wind matters grew worse, so that our engine boiled every ten minutes, necessitating frequent stops to refill the radiator with our precious water. The sand was heavy, and we seemed to be surmounting an interminable rise, so that it was well after midday before we finally reached the long down grade that led to Lunakie. This valley had once been a river bed. The desert had not only hemmed it in, but was doing its best to blot it out of recognition entirely. Each wind that blew dropped a thin veil of tiny particles of sand so that the valley was already filled up above and below, leaving a bare, saucer-like depression in which the natives had their melon patches.

These Bakalaghadi, fleeing first the Bakwena and later the Matabele, settled down wherever they could find a piece of land that was not wholly choked with sand, and there they built their kraals. It is interesting to read what Livingstone writes of them. "The Bushmen," he says, "live in the desert from choice, the Bakalaghari from compulsion, and both possess an intense love of liberty. . . . The Bakalaghari are traditionally reported to be the oldest of the Bechuana tribes and they are said to have possessed enormous herds of the large horned cattle, mentioned by Bruce, until they were despoiled of them and driven into the desert by a fresh migration of their own nation. Living ever since on the same plains with the Bushmen, subjected to the same influence of climate, enduring the same thirst and subsisting on similar food for centuries, they seem to supply a standing

proof that locality is not always sufficient to account for difference in races. The Bakalaghari retain in undying vigor the Bechuana love for agriculture and domestic animals. They hoe their gardens annually, though all they can hope for is a supply of melons and pumpkins. They carefully rear small herds of goats, and I have seen them lift water for them out of small wells with a bit of ostrich shell or by spoonfuls. They generally attach themselves to influential men in the different Bechuana tribes living adjacent to their desert in order to obtain supplies of spears, knives, tobacco and dogs, in exchange for the skins of the animals they may kill."

Hard pressed indeed must people be who would choose Lunakie as a home. As I remember it, the wilderness had already marched across the valley above and below, completely ringing it in. But for a mile across the shallow depression not a shrub or a tree was to be seen. The natives had long ago swept it bare of everything that would burn.

The women and children who had been busily engaged cutting melons and spreading the slices and seeds to dry soon gathered around, laughing and chatting merrily as we unloaded the truck. Each woman wore a skin apron and a kaross caught over one shoulder and leaving one breast generously bare. The little girls wore string or bead aprons, the boys a strip of hide widening into two flaps behind.

The huts were of the primitive beehive shape surrounded by a fence of thorn bush. They were built each with a framework of crooked poles piled thickly together, the spaces being filled with a thatch of desert grass. On a fire between two huts was a three-legged Boer pot filled with melon strips, bubbling over the flames. On a springbok skin the melon seeds were being dried in the sun.

For those who live at Lunakie, life must, according to our

standards, be most restricted. To this little enclosure with its fence of thorns comes the girl wife, not yet paid for by oxen, for these people are too poverty stricken to pay the *bogadi* until children are forthcoming. On the same clay floor she must lie for the consummation of wifehood, the pains of childbirth, the pangs of death—for the sowing, ripening and harvesting of life these few square yards are enough.

The happenings day by day in this Bakalaghadi kraal must be trivial and scanty. There are visitors going to and from the huts, but limited indeed must be the sum of their communications. The death of an ox, sickness or death in the kraal, the signs of drought or rain—among this handful of people these topics must surely be worn threadbare on their tongues. In such a limited audience one would think that individual social values would soon be accurately determined, and the boaster, pretender, and liar quickly known for what they are. There can be nothing hidden at Lunakie.

It may be difficult to enter into the interests of these desert dwellers but it is easy to understand their fears. The thorn fence seemed such a flimsy barrier to keep out the carnivorous beasts when these are about. The lion as everyone knows is usually not to be feared, but when there is a drought and game is scarce it may be a different story. One may turn man-eater for various reasons—sometimes he becomes bad-tempered because of a porcupine quill stuck in his cheek, the festering wound preventing him from doing his ordinary hunting and so he turns to man-killing. Then occurs a reign of terror, which lasts till the killer is hunted down and destroyed. The old men told Knobel of nights when they sat on guard, each man in his hut with assegai braced firmly in the ground, lest a bold paw tear down the

flimsy mat barrier that forms the door and hides the cowering folk inside.

Occasionally a child has been carried off by a hyena or a lion has sprung upon a woman emptying the ashes at the back of the hut, but these fatalities are rare.

Against all these and many other perils of forest and way-side, the prudent man will avail himself of charms. The claw of the lion, the whiskers of the leopard, the skin of the snake, the scrapings of buck's horns, the toe-nails of the hyena if mixed together and burnt by the witch doctor carry protection in their smoke. So the new born babe must be held over the magic fire, the ashes of which, if mixed with the water he drinks, will give additional protection.

Considering the narrow range of experience of the dweller in Lunakie, it is no wonder that the claims of the magic worker are rarely questioned. In all that concerns life hereabouts there is but a narrow margin of certainty. The hut may catch fire; a sudden swarm of locusts may light on the fields and leave only bare and withered stalks behind them; the rains may fail and the melon vines be bare; the ox may be bitten by the puff adder and die. In spite of all his charms the wayfarer may be struck by summer lightning, or he may set out for the cattle post so late that he is overtaken by the darkness and never heard of again. The man who has had a curse placed on him or his possessions will meet with enough mishaps to prove its power; or if no such threat is known, then misfortunes will be ascribed to the unwitting transgression of some taboo. A menstruating woman may have passed by the cattle post and so the ox died; or in the burial of a person some rite was neglected, and the spirit of the departed, jealous of the living, returns to work them ill.

Occasionally some individual of tougher fibre may defy the taboos, but this has no effect as a negative instance. It

will be simply said of such a one that he has stronger medicine of his own. It is hard for the desert dweller not to believe that the chances of life may be manipulated if one only knows how. Death beckons peremptorily for man as well as beast in the Kalahari. "Maano ga a site go situ a losho," runs the Bechuana proverb. "Plans do not always overcome, but death does." And anything that seems to lessen the chances of death is welcomed. Fate is apparently so inexorable that the native would be entirely without hope, did he not believe there is a loophole somewhere, and that it can be found. Divination is the common practice and much honor is paid to the skilful thrower of the bones. These vary in number but are usually four—two male and two female, one representing authority and the headman of the kraal, the second women and children, the third cattle or property, the fourth the game. They are carefully blown upon, then thrown. From the position in which they lie events are foretold or the happenings of other parts of the veldt determined. Thus success in a hunt, or the outcome of sickness, or future prosperity and misfortunes are foretold.

Magic has other symbols. The hunter hangs round his neck a string of leopard claws or lion's teeth, or pieces of wood from a tree that lightning may not strike. You may buy a man's skin kaross easily, his cattle rarely, but his charms, not at all.

Life, even when devoid of tragic mishaps, has its ordinary hardships and the chief among them is scarcity of water. When the melons fail the Bakalaghadi must fall back on their emergency water stored in ostrich shells, which have been emptied of their contents through a tiny hole that can be later plugged with a stick or wisp of grass. The story of men marooned in an open boat at sea where life depends on water measured out in spoonfuls excites our horror and pity

as a tragic emergency, but this for months at a time is the ordinary, everyday condition of the Bakalaghadi. In payment for keeping our surplus stocks at Lunakie while we went further into the desert, we gave the woman of the kraal an empty four gallon drum. The opportunity to store this amount of water in a single receptacle she considered an inexpressible boon. It not only lessened the hazards of life but its possession meant wealth and prestige for her family. Our visit was in another sense a happy one. When Knobel told the man of the kraal—a merry looking, tufty-haired, open faced old gentleman—that he could have the meat of the gemsbok we had shot, if only he would preserve the horns, there were delighted smiles all round. In a moment the old fellow had shaken off his kaross and set off on his fourteen mile run at a dog trot that soon carried him out of sight over the rise in the direction of Motate.

This news of fresh meat was the best these people had heard for many a day. That night, though we were far away, we could imagine the cooking fires lighted and the pots aboil, and knew that there would be singing and dancing until daylight at Lunakie. For such a boon as a whole gemsbok, a twenty-eight mile run with a five mile deviation to obtain help from the nearest cattle post, was a small exertion, to be undertaken lightheartedly, even by a man long past his prime.

CHAPTER VII

BUSHMEN OF THE SOUTHERN KALAHARI

THE evening shadows—had there been trees to cast them—would have been long by the time we reached Khutse Pan. Such trees as there were seemed so thin and scattered and stripped of leaves that they formed a mere scrabble of vegetation on the skyline. As we neared the pan some of the early foragers of the veldt had left their midday stations and had begun to feed. A couple of hartebeeste bulls went off at a lumbering gallop, and a stray jackal, surprised by our sudden appearance round a turn in the track, whipped off into the bush. To add a truly Kalahari touch, eight or ten ostriches, silhouetted against the setting sun, paced slowly along the rise that shut us off from the first view of our objective.

The pan itself was a long shallow vlei bordered on the far side by a mile-long thicket of thorn bush. Its surface was covered with a kind of salt weed upon which the eland, the largest of the antelopes, likes to feed. In the center a bare chalky patch marked the position of the only surface water in a hundred and fifty thirsty miles. As we filled our water cans with the milky fluid, a Bakalaghadi youth, dressed in a skin coat cut European fashion, a hyena skin cap, and a gee-string, came down the track behind us. His name was Raumkavideo—the little red father—and he was the nephew of the headman whose kraal lay half a mile beyond the pan. For a blanket as payment he would be our cook and camp boy.

Our first enquiry was with regard to lions. Raumkavideo said there were some around, for the last two nights they had circled the Bushmen's camp, keeping them awake all night with their roaring. It seemed that the Masarwa, as the natives call the Bushmen, had killed a partially disabled gemsbok and had hung the meat in a tree at their village. The lions had probably also been trailing the gemsbok and had followed the hunters to their camp. So close had they come that the Masarwa had been constrained to leave their individual huts and gather round a large central blaze from which they could hurl firesticks into the darkness when the prowlers came too close.

This news of Bushmen and lions made us eager to make camp. We drew the truck into the thicket beyond the pan and in a little while half a dozen Bakalaghadi from the kraal were at work cutting thorn bush to form a thick wall, within which we and our belongings could be bestowed. I must confess I eyed with some misgivings the wide space that was left to one side. This was where the fire was lit and where Raumkavideo slept. The barricade itself seemed very low, and I laid my blankets as close to the brush as possible so that if Tau, as they call the lion, should leap over, the chances were that he would land beyond me and nearer my companions, each of whom would have made much better lion meat than I. However, we were not disturbed, although the quiet was no proof that the lions were not close by. Raumkavideo said that they were probably looking us over carefully before making their presence known.

Our first day at Khutse was spent in fixing camp and setting up my instruments, etc., in preparation for work with the Bushmen. Breakfast was scarcely over when we had visitors—the headman accompanied by his younger brother, Bokhame, who came over from the kraal or native “stadt”

as the Dutch call a village. Bokhame was a thin-bearded native with a rather Semitic or Arabic cast of countenance. His sunken eyes and drawn cheeks gave ground for the suspicion that he was addicted to smoking *dagga*, or Indian hemp, whose narcotic effects are very pronounced. We were very interested in the fact that he did all the talking, the headman sitting morosely by; we could not tell whether the latter was merely stupid or sullen, or whether he were the victim of some intrigue by which Bokhame had usurped his position and powers. Apparently the same old struggle for domination goes on, even among such a handful of poverty-stricken souls in the desert.

When one visits a Bechuana stadt the first question asked of the stranger is "Where are you from?" The next refers to a matter of everlasting interest in the Kalahari, "What are they eating there?" To this the usual reply is given, "Oh, little or nothing—starvation fare. You know how it is—there is always hunger." If conditions are really good, the visitor may add, "But we manage to hang together," implying that the village has not yet reached the stage of want when all must scatter in search of food.

At the back of this show of pessimism, even when there is no distress, is the fear that boasting may bring bad luck. The unseen spirits may be offended. For this reason, when all previously born children have died, the next child may be given the most opprobrious name possible. One of the Bushmen I examined was called "Weeping always," a name that perhaps reflected his parents' disposition rather than his own, which seemed particularly merry. If a child dies the next may be called "The ugly one," or "Tail of a dog," with the design of averting the spirits' notice from a child of such little account.

The habit of approaching the truth by indirection was

characteristic of Bechuana in Livingstone's day, and impressed the missionary rather unfavorably. "The first enquiry," he says, "a native puts to a fellow countryman is 'Where is the rain?' and though they are by no means an untruthful nation, the answer generally is 'I don't know—there is none—we are killed by hunger and by the sun.' If news is asked for, they commence with, 'There is no news. I heard some lies only,' and then tell all they know."

In this case I was the news and Knobel did his best to explain the purpose of my visit and my desire to get into touch with the Masarwa, who were nominally at least subject to Bokhame's brother, the headman. Knobel could hardly picture me as a very wise man, since the fact that I could speak no Sechuana put me down in their minds as an untutored person. In reply to his request that Bokhame arrange for the Bushmen to visit our camp so that I could see how clever they were and where we would give them gifts of meat and tobacco, Bokhame launched forth into a seemingly impassioned harangue, which Knobel translated for my benefit.

"What does the white man want with the Masarwa?" Bokhame asked. "If he has come such a long way to find clever folk, why does he look past me and my people? As for the Masarwa, who can tell them where to go or what to do? They own neither cattle, nor land, nor master, but are here today and gone tomorrow, no man knows whither. When there is food to be shared, they are here with both hands open; when there is work to be done no one can find them. Who are the Masarwa, anyway? They are not men like us Bakwena, but Bushmen—things of the veldt; like the animals, springing from the soil with neither chiefs nor ancestry. Things of the veldt indeed! I have no authority over them—as well ask me to gather the jackals together!"

To all this excited speech, Knobel seemed to pay but little heed.

"The old boy," he remarked to me, "is certainly presuming a great deal to speak to me of 'us Bakwena.' He would not dare talk like that if any real Bakwena were present. He probably thinks that if he can keep the Masarwa away, then there will be all the more meat and tobacco for him and his people. I'll soon show him that he is dealing with a man who did not come down in the last shower."

His reply was brief and to the point. "No Bushmen, no presents," he said. "And if you can't find the Masarwa we will move on to Qusi where we are told we can find them." At once Bokhame changed his tune.

"No," he said, "you must stay here. The lions at Qusi have drunken all the water and are very angry. They have no shame, but kill cattle and attack people as if they owned the veldt. Just last week the lions of Qusi killed a calf and when I and my people followed the spoor to save some of the meat, the lions had so much to say about it that we turned round and came home empty handed."

He went on to say that he would do his best to find the Masarwa, but in the meantime he was a very sick man and would we give him some of the white man's medicine? The doctor gave him several pills to which I added two packets of Epsom salts, a medicine much prized by the natives. Next day he indicated by dumb show that the physic was ineffective so I gave him another three packets. When he complained the third day, I suspected that the old schemer was stocking his private medicine chest at my expense, and personally superintended his swallowing a couple of Alophen pills and some cascarras. He did not come to the camp for a couple of days and when he reappeared, eyed me, I thought, a trifle reproachfully.

On the third day six of the Masarwa filed into camp. Three of them were almost yellow in skin color, and were shorter in stature but more stockily built than the Bakalaghadi. Their cheek bones were high and rather prominent, their upper lips short, their mouths wide but not thick-lipped, their chins small, giving them the characteristic appearance that has been described as "fox-faced." The outer angles of the eye fissures seemed to be extended far out towards the temples, giving them a rather quizzical appearance.

The other three had longer faces, were narrower headed and of darker skin color, altogether more negroid in appearance. Their hair was in peppercorn whorls with the scalp showing between. All were naked except for a thin strip of skin between the thighs. Each had a skin cap, into which was stuck, very jauntily, an ostrich feather. This was something of an index of character. A man who wears an ostrich feather as head gear is certainly, I should think, of a rather carefree, extrovert disposition. Other ornament they had none except a thin wire amulet drawn tightly around the leg just below the knee.

That afternoon I had an opportunity to observe the skill of the Bushmen in tracking game and to compare it with that of the Australians. In the morning my companions had wounded a hartebeeste which had run across the veldt between our camp and the native stadt about a half-mile distant. In the late afternoon we set out on its trail.

Two men did most of the tracking, walking abreast with one hand open, indicating the spoor. The animal had zig-zagged across the veldt, making the most of every thicket that might serve to hide it from pursuers. Once or twice it had lain down to rest its wounds or had wheeled round after entering a thicket to look back along its trail. At such spots the ground was thickly pitted with game tracks, new and old.

Here, momentarily, the trackers would be at fault, and the men would scatter, quartering the ground like a pack of dogs, until the spoor was recovered. In the sandy soil the hoof marks were plain enough; it was judging their freshness and thus distinguishing them from others that was the proof of skill.

After proceeding a couple of miles from thicket to thicket, the hunters became more cautious. They, too, began to take advantage of cover, and while the two men continued to do the trailing, the rest kept a keen watch for the animal. Suddenly they made signs that the next clump of brush contained our quarry. How they knew I could not discover, but sure enough, as we approached we caught a glimpse of the hartebeeste's head and neck as it wheeled and fled. Whether the Masarwa can follow what is to a white man's perception an indistinguishable trail over hard ground as skilfully as the Australians, I had no opportunity of judging, but certainly their ability to interpret what they saw was equally remarkable.

That night when we were eating in camp an incident happened that illustrated very well the relationship of Bakalaghadi and Bushmen. An eland had been shot in the morning and while the main party followed the wounded hartebeeste, four of the Bushmen back-tracked the hunters to the kill and just at nightfall filed into camp bearing the meat on their heads. We had noticed that services, such as gathering firewood or bringing a light for the tobacco which was smoked through a hollow bone, were required of the Masarwa by the Bakalaghadi, but this experience indicated something more than a master and servant relationship. The night was cold and all the natives were gathered on one side of our campfire, the Bushmen being furthest from the blaze. Thinking that Raumkavideo might be hungry I passed him over a

cracker. He at once broke off a small piece and passed the rest back to his Bakalaghadi companions. Each took a little and in turn passed the remainder back to the Bushmen. There could have been hardly more than a crumb left for the Masarwa, but each had his share. I waited till this was eaten and then handed Raumkavideo another cracker which was as scrupulously divided as before. I wondered what he would do with a half cracker, too small to divide, but this our boy merely put on one side. Whether he ate it later I do not know, but at least he did not do so while the group was present. I thought it a fine example of courtesy and good manners.

The Bushman village or "werft," as it is often called, lay a couple of miles across the veldt, and next morning Knobel and I paid it a visit. We drove the truck about half-way and when the brush became too thick we left it and walked in the direction where the camp was supposed to be.

We soon came upon a youth carrying a bush fiddle consisting of a stick of wood about four feet long, hollowed out on one side, along which ran a single string. As sounding board a battered tin fitted over one end of the stick. By means of a miniature bow, four tinny notes could be produced. In an evil moment I signed to the youth to play the fiddle for me. It was easy to persuade him to start but impossible to stop him, so for the rest of the morning he followed me everywhere, sounding the same four notes in endless repetition. Like Milton, he had evidently one talent which it was death to hide. Before the morning was over I would have much preferred his death.

Soon we saw a group of women digging for tubers in the veldt, but when they saw us they scattered like a covey of frightened quail. Reassured at the sight of our fiddling friend, they reassembled, and in a moment were standing in line

before Knobel, all talking at once with an unbelievable clatter of clicks. Their behavior was very different to that of a group of Australian aboriginal women, who would have remained, under similar circumstances, sullenly silent. These women were all comparatively young. Each one wore a skin kaross caught across one shoulder in the usual manner, and an apron ornamented with strings of ostrich eggshell beads, suspended from a thong around the waist. These beads are made by first softening the shell fragments in water, boring a hole through the middle with a bone awl and then rounding them off by rubbing them against a stone. The men are the tailors, making the clothes for the women.

One of the younger women was decked out like the belle of the desert. She wore a kaross of dressed springbok skin and possessed several bead necklaces, the beads being interspersed with colored seeds and pieces of a brown root hollowed and polished. About her person were hung small skin vanity bags filled with an aromatic powder made from a powdered root called *buchu*. For a compact they use a piece of tortoise shell and dab the powder over their bodies with a powder puff made of a last year's bird's nest or the tip of a jackal's tail. This use of cosmetics was not borrowed from the whites, as quite probably the Bushwomen were the original users of such aids of beauty. Red ochre, grease and powdered charcoal are also additions to Masarwa charms. In appearance the women much resembled the men, with the same characteristic triangular faces.

As in Australia, the digging stick is the woman's tool—about four feet long and hardened by fire. Where the ground is hard or rocky the efficacy of the tool is improved by fitting on to the handle a round perforated stone, which adds weight to the implement and gives better leverage.

The village or werft consisted of five or six huts grouped

irregularly about the top of a small rise. The framework of each consisted of bent poles stuck round in the form of a semi-circle so that the free ends met overhead to form a half dome. The interstices between the poles are then filled with grass and light brush weighted down with sand. Made in this way the huts blend so well with their surroundings that they are hardly visible a short distance away. Unobtrusiveness rather than concealment seems to be the plan, and the protective coloration of the veldt is fully availed of. The women build the huts, and are very careful not to group them too close together lest a suspicious thickening of shadow bring them unwelcome attention. Nor is the village placed in a hollow or thicket which would be the first place to be searched by an enemy. There is not even a thorn bush enclosure, the Masarwa evidently preferring danger from lions to the risks of making their camp conspicuous. For the same reason the people always approach it from a different direction so that no tell-tale paths are worn.

A city set upon a hill cannot be hid, but a Bushman werft may, especially if that hill is merely one of very many low rises that rumple the surface of the wilderness. No doubt this secretiveness is a relic of the time when every man's hand was against the Bushman. Now it serves the purpose of keeping the camp free of unwelcome visitors. Whether white or native, such visitors usually come seeking service of some kind from the Bushmen, who have found that the best way to keep their freedom of action is not to be too easily found.

I looked at the huts with interest. In each the available space had been increased by scooping out the sand to a depth of six or eight inches. On the ledge of sand at the back were the family possessions—a half-dozen ostrich eggshells, a carved wooden pestle and mortar for pounding up grass

seeds or roots, an excellently carved bowl and a couple of tortoise shells, which could serve as ladles or plates. In front of the opening of the hut the fire is lit, the half-domed structure serving as an excellent heat reflector. Each hut was placed close to a fair sized tree, which could provide not only a little shade but a refuge from lions if they became too bold. The other natives say that the Masarwa burn a certain shrub that gives off a very acrid smoke which is supposed to be very disagreeable to lions. I could not obtain any confirmation of this statement. If the story is true, the identity of the shrub is a Bushman secret, carefully kept.

Everything about this camp smacked of impermanency, giving the observer a sense of being merely makeshift, a brief halting place between nomadic marches. As I wandered round the camp—still attended by the youth with the fiddle—I felt that this was the most primitive way of life I had yet encountered. The wurleys of the Arunta and Luritja in Australia are ruder habitations, merely windbreaks of bushes in a dry creek bed; their material possessions are even poorer—a container of wood or bark and some rough grinding stones. Yet they have succeeded in building for themselves a social structure of no mean order, an organization that in its adaptability to their conditions of life seems to evidence forethought and planning far beyond any that the Bushmen exhibit. Among these Kalahari folk the single family, occasionally enlarged by temporary associates, is the social unit. There is neither chief nor tribal council and hence no authority to whom social problems can be referred. When the whim seizes the Masarwa, or circumstances dictate, the group may dissolve, each family to wander alone on the veldt or to ally itself for a time with another group. The only social regulation seems to be that a man must seek his wife outside the district to which he belongs. Among

such foot-loose wanderers it is easy to see why the very young and the very old are regarded as impediments to freedom, to be killed or deserted.

After a few days around our camp the Bushmen had become quite used to our presence and I managed to complete my testing and measuring. Through Bokhame a request was made that they should dance for us at the Bakalaghadi stadt. As they were well fed with eland meat, the idea seemed to please them, and with much laughter and volleys of clicking conversation they consented. The women at once went away and reappeared in the afternoon bearing large bundles of firewood on their heads which they carried in the direction of the stadt.

We had kept two men at our camp and just as we set out with flashlights and overcoats one of them surprised us by letting out a series of long drawn yells directed apparently at nowhere in particular.

Raumkavideo explained this performance as an escape valve for high spirits. He was warning the camp of his imminent arrival, letting them know that his belly was empty and enjoining the women to build the fires and put on more eland meat—in short that he was on his way, so let the fun begin. We heard no answer but Raumkavideo assured us that he would be heard and understood.

Flashlights were necessary to enable us to avoid the old-time Bushman game pits that here thickly studded the veldt. As we approached the kraal our Masarwa companions drew off and disappeared in the dark, leaving us to group ourselves about a little fire that burned not far from the headman's hut.

We had a long wait. There were twelve or fourteen of us, Bakalaghadi and whites together, gathered closely around the little blaze, for the night chill which comes at evening

was upon us. The Bushmen evidently intended to feast before they danced and no doubt were off somewhere in the veldt cracking the eland bones alongside their little cooking fires. As we waited for them to appear there came to us, keyed up in anticipation as we were, a decided let-down in spirit. Huddling together over the fire, we seemed as far away from gaiety and laughter as could be. Expectation had died, and as for myself, had I been one of the Bushmen nothing on earth could have induced me to dance or sing.

Knobel had brought with us, as part of our desert equipment, a bundle of rockets, the idea being that if one of us should get lost on the veldt, a rocket fired after nightfall would give him the direction of the camp. As our contribution to the evening's entertainment and in the hope of helping matters forward, we set a light to one of a pair we had carried over from the camp. It fizzed and spluttered and finally went off with a bang one hundred and fifty feet in air. We succeeded only in frightening some of the Bakalaghadi women almost to death, which brought an earnest request from Bokhame that we should refrain from shooting down any more of the stars lest the Masarwa leave in panic and be seen no more.

Finally the Bushmen appeared and at once one of the boys ran with a firestick to light the heap of wood that had been piled in readiness. Still, things seemed to lag uncertainly, and I wondered whether the chill of the evening or the sense of our depression had given a fatal check to that spirit of anticipatory excitement that had been apparent among the Masarwa during the day.

But soon the blaze at the women's fire grew stronger and as it pushed back the shadows into the veldt our spirits rose. The Masarwa women were joined by seven or eight others from the kraal and standing in a close circle they began to

clap their hands, the rhythm, strange in itself, being broken into by an older woman clapping at a different interval to the rest. Then one of them lifted her voice in a high-pitched note, the rest joining in a shrill ululating chorus.

Then the dancing began. The younger boys were first on the ground, but one by one the older men joined in. As they danced their bodies were bent a little forward, their arms swinging in unison at their sides, their breath exhaled in deep, animal-like grunts. Their eyeballs glinting in the fire-light, they moved about a small circle with a queer propulsive shuffle, feet held close to the ground, the heels of each kicking up little puffs of dust that settled down to form a ring about the dancing ground.

The measure grew livelier and excitement rose. Soon the boys were dashing off into the darkness, returning from their huts decorated with cocoons strung around their ankles. These contained small stones that shook and rattled with the movements of the dance. Some held sticks in their hands and others oxtail whisks. Even old Bokhame joined in, looking very dignified in his long kaross, his black beard shining under his hyena skin cap. We noticed he held himself very erect and did not move his arms like the rest, and at one point left the line, cutting across the circle and making a little dust furrow of his own.

Presently one of the Bakalaghadi girls broke from the group of singers and began to dance along with the men but just outside the circle. She had a different step with considerable posterior swaying and wriggling. One of the Bushman youths, whose staring eyes and deep grunts had attracted my attention, sidled up beside her and for a little while they danced together, his eyes fixed on her with a side-long glance that seemed to have something particularly lascivious in its intent. Finally with a peculiar backside

wriggle that made her bead-bedecked apron rattle vigorously, the girl began shuffling backwards until she again came opposite the women, when she ceased dancing and midst the laughter of the onlookers resumed her place among the singers. Hers was evidently a provocative gesture directed towards the young Masarwa.

The slow progression around the small circle, the comparatively restrained movements of the dance, the rhythmic grunts of the men, the singing of the women, and the very monotony of the whole thing combined to bring about an intentness that is conducive to a state of self-hypnotism. One felt that any more vigorous or unrestrained motions would act as a release of emotion, whereas this repetitious performance was most favorable to accentuating those primary excitations which the psycho-analyst says spring from the "unconscious." The fixed, staring eyes of the dancers indicated clearly enough that an hypnotic condition was already being induced.

In the meantime Raumkavideo and one of the Bushmen remained at the fire. It seemed that the Bushman did not, for some reason or another, feel in the mood for dancing. As for Raumkavideo, I think that he considered he belonged to the white man's party and therefore was under some constraint of dignity not to dance. As soon as I urged his participation, he sprang to his feet calling to the singers, "Matori! Matori!" The rhythm of the song at once changed and he dashed off into the darkness, returning with anklets and a zebra tail to join the dance. Then followed a somewhat livelier performance, the men going round in a circle as before, but every now and then uttering a sharp cry and making a little jump in the air.

Sometime after midnight we decided to go home, and set off across the veldt under Raumkavideo's guidance. Con-

fused by the flashlight, he led us astray so that we missed the camp in the thicket by several hundred yards and had to pick up the right direction by means of the Southern Cross. His becoming "bushed" was evidently the joke of the season, for next day the Masarwa who had evidently watched our light and followed our tracks, amused the whole camp with a ridiculous imitation of Raumkavideo with his eyes shut wandering about, his hands held out in front of him as if feeling his way.

By the time we had wrapped ourselves in our blankets the stadt was silent. Joy is but momentary, and with the dying of the blaze the Kalahari night with its scarce withheld terrors had returned. Against these terrors sleep is no defence, but it may provide forgetfulness.

CHAPTER VIII

MASARWA LIFE AND CUSTOMS

It would, of course, be wrong to assume that a socially disorganized group, such as the Bushmen of the Southern Kalahari, presents a representative picture of the life of Bushmen in general. Because of their scanty numbers and their wide dispersal over a scarcely travelled and inhospitable region, a satisfactory account of these people and their customs must be in the nature of an anthropological patchwork, the work of many hands. Scientific descriptions are so few that they must be supplemented by observations by missionaries, hunters and travellers. Indeed there seems little agreement as to who the real Bushmen are.

Dornan,¹ for example, includes among them the Makuba, a river tribe in Ngamiland. He says: "But the great fishermen amongst the Bushmen are the Makebaso, who live mainly in the swamps of the Okavango river. They are said to be different from the ordinary Bushmen of the Kalahari, but from what I can learn there seems to be no real differences. No doubt they are taller and darker than the average Bushmen, but size and color are no criterion of the Kalahari Bushmen and besides they resemble these people in many of their customs and language." Having had opportunities to observe these people, I would say that they are not Bushmen in any racial sense, irrespective of similarities in language and custom, for if size and color and physical characteristics

¹ Dornan, S. S., *Pygmies and Bushmen of the Kalahari*. London, Seeley Service & Co., 1935.

in general are not the criterion of race, then race has no meaning.

Schapera, who has compiled from all available sources the best account of the Bushmen, also affirms that they are of the same racial stock and, on the whole, fundamentally of the same physical type. My experience would lead me to the opposite conclusion; namely, that whatever else the people called Bushmen have in common, they are certainly not of the same physical type.²

The name "Masarwa," which is most generally applied to the Bushmen by the Bechuana, is said to have as its root the word "san" or "sanqua," meaning aborigines or merely people. To this has been added the plural prefix "Ma." Other names are given to various tribes. The Heikom, who live in the northwest near the Etosha Pan, have a name which means tree-dwellers, or tree-sitters, perhaps because they were so often driven to the trees to escape the lions. Hiechware, the name given to another group in the north near the Mababe Flats, means "people of the open country." The Naron of the southwest are "the insignificant people." Since these Bushman groups are widely separated they differ in social characteristics. The following description of Bushman life and customs must therefore be considered a generalized account not applicable in its details to all groups, and true only of a time before social disintegration had proceeded as far as at present.

Even when the Bushmen were most numerous, the small band was the social unit and there was consequently little tribal cohesion. Dornan says:

"Each little group of families had its own hunting grounds, and bitterly resented the intrusion of others, either natives or Euro-

² Schapera, I., *The Khoisan Peoples of South Africa*. Routledge, London, 1930.

peans. Needless to say they acknowledge no paramount chief, or central authority, and are proud, independent and impatient of restraint of any kind. . . . Their love of freedom amounts to a passion, and they have a deeply rooted antipathy to authority of any kind. Thus cohesion of a permanent character practically does not exist.”³

This statement, made on the basis of knowledge of the northern tribes, accords with Fourie’s account of the Bushmen of Southwest Africa and illustrates a certain basic homogeneity of custom among these people. “Each family group,” he says, “forms an independent unit by itself, possessing its own group area, and authority over and specific rights within such area only. . . . Each family is inseparably united to its habitat and has a superstitious dread of any locality but its own. The result is that even the members of completely disorganized groups are loth to seek employment outside the boundaries of their ancestral territory.”

Fourie goes on to say that over each group is a “big man” or chief but who exercises no authority over the rest. Because of certain functions vested in him, he does, however, exercise considerable influence, and the area with its food and water supply as well as the fire are looked upon as belonging to him.⁴

A similar division of the hunting territory among family groups exists in Australia, but there the totemic system binds these families together, and the totemic groups in turn are united in tribal ceremonies, while the bonds of blood relationship are further extended through the marriage classes, sections, or subsections. It is, however, interesting

³ Dornan, S. S., *Pygmies and Bushmen of the Kalahari*, p. 85.

⁴ Fourie, L., “The Bushmen of Southwest Africa” in *The Native Tribes of Southwest Africa*, pp. 85, 86.

to note that both in Australia and in Africa the family group has exclusive rights over its own hunting territory.

There are certain psychological results that accrue through living in such socially isolated groups as are found among the Bushmen. In such contracted associations the individual gets but little assurance from the company of his fellows. He sees himself as single, unsupported. Every misadventure in his group is impressive because it strikes so close home. To people who live like the Australians and the Bushmen, a single death or an accident is an unhappy reminder of their own mortality. It is to the man of the veldt rather than of the crowded city that the observation "as the grass of the field so he withereth" comes uppermost to mind. There is a sense of security in crowds, that is denied to the lonely wanderer.

Even the winds that blow, the falling rain, the stars in their courses conspire together to make him realize his littleness. The Australian aboriginal tries to place himself on terms of familiar relationship with these great natural forces by making them part of his totemic system. Clouds, rain, wind are some of his totemic symbols. But to the Bushman all nature seems inimical. The wind that rushes across the veldt is a huge bird that is the forerunner of death. It cannot be seen but the beat of its wings can be felt as it passes by. It is in league also with the beasts of prey, for it shows where timid or benighted folks are hiding, and, under cover of the commotion it raises, lions make their stealthy approach. When gusts sweep about the camp and scatter the fires, the wind spirit is angry and the Bushmen lie close.

The rain, too, is respected and feared. It falls usually in the hot months from November to March, the season of violent thunderstorms. To the Bushman's mind it is the rain

which brings the thunder and it must therefore be propitiated. The ghosts of dead men ride the rain. If you stand and listen as the storms beat their way across the veldt you may hear them muttering angrily together.

At such times the prudent man will bring himself to the recollection of the dead so that the spirits may pass him by unharmed. At the beginning of the storm he will sing:

"Oh gallopers, oh gallopers
Do you not know me?
You do not seem to know my hut!"

At other times the sound of the tempest is like the noise of a great beast charging across the veldt. He seeks to shame it into avoidance by singing:

"Thou shouldst put thy tail between thy legs
For the women are looking shocked at thee."

There is a bird called the lightning bird (*Scopus umbretta*) and this is supposed to be the special messenger of the thunder. No man will kill it or take its eggs, as the Bushmen believe that a man who has come between it and its nest will be struck by lightning.

Growing girls are in some mysterious fashion intimately connected with the rain spirit. Therefore they must not be rude, nor point nor snap their fingers at people or the spirit's anger will be aroused and harm will befall. To speak to a girl when she is silent is equally unlucky. When the storm comes girls must run and hide from the rain. If they are out in the veldt alone they may be caught and carried off by the rain spirit.

Though it is feared, the rain is also revered as the life giver. The Bushman believes that if an ostrich feather is

blown into a pool of water it becomes a new ostrich. Frogs, tortoises and fish are animals which are under the special protection of the rain and to kill these may occasion a drought. Eland bulls sacred to the rain are commonly depicted in cave paintings. Rainmakers know charms that enable them to tame these rain elands and to lead them about the country and wherever they go showers fall.

The religious beliefs of the Bushmen vary, but in some tribes they speak of a very powerful and beneficent spirit called Cagn or Kang. He sends the rain and brings good luck in hunting. The birds are his messengers and carry him the news of the veldt. He cannot be seen but the Bushmen say that the eland know his voice and where he is they are in droves like cattle. It is true that these animals will often behave most unaccountably. As Knobel and I returned from the Bushman village there was a herd of fifty or sixty feeding on the pan a half-mile away. Suddenly at the sight of the truck they set off at a gallop towards us, passing not sixty yards away and leaping high in the air. A Bushman watching this strange behavior might easily believe that they had heard the call of Cagn, the herder of the eland.

According to Dornan,⁵ the Bushmen believe in other great spirits which strive among themselves for mastery. Thora is the good spirit who sends the rain and the game and gives good luck in hunting. Huwe wards off disease and protects the Masarwa from enemies. But Gaua or Khauna as he is variously called is the destroyer, the spirit of lightning, who brings bad luck and disease. The tribes to the west of the Kalahari believe that people who die a good death go to Khutse and live in plenty, but those who go to Gaua suffer hunger and distress. Strangely enough, Khutse was the

⁵ *Pygmies and Bushmen of the Kalahari*, p. 150.

name of the pan where we were camped, and the profusion of game there may have given rise to the idea that it was the mythical land of plenty.

"To the Bushmen," [says Dornan], "everything about them seems alive with some kind of spirit, lightning, eddies of wind and dust, storms, thermal springs, and every other kind of natural phenomena are only so many kinds of spirits and are looked upon with fear."

The Arunta in Central Australia believe that the stars are the campfires of the dead, those on one side of the Milky Way belonging to people of their own tribe, those on the other to the Luritcha, their neighbors. To the Bushmen also the stars are the campfires of the departed. The Heikom in the northwest say that thunder and lightning are the instruments of Gauob, creator of mankind, and when he is displeased he plucks a star from his hearthfire and hurls it at a man and the man dies.

To other Bushmen the stars are friendly spirits. Canopus is called the grandmother of the Bushmen, because it brings the season when that delicacy of the wilderness larder, the larvae of the white ants, is gathered by the women. Roasted in the ashes, and sieved through a closely woven mat of grass, they are eaten with much relish and have been given the name "Bushman rice."

When Canopus shines full and clear and high in the heavens just before sunrise, the Bushman knows that the distressing cold of winter will soon be past. So he tries to strengthen its light by taking a stick from the headman's fire and pointing it at the star. This is called "putting the fire in grandmother's eye."

The moon is also held in special reverence, for it is concerned with the bringing of rain. The new moon is a man,

because of its slender shape, the full moon a woman. Bushmen sing to the moon to bring them good luck in hunting, for as it shines at night it watches the game and marks where they hide in the daytime on the veldt. The poison which is put on the arrows must be applied fresh and as the hunter is doing so he holds the arrow up to the moon and sings:

“Oh moon lying there
Thou must look at this arrow
That I may shoot a springbok with it tomorrow.”

In other parts of the Kalahari, the moon and the sun are represented differently; the sun is a young girl, the moon an old man, and alternately they pursue each other across the heavens, going to their camp in the west and returning unseen to their camp in the east. In Australia, also, the Arunta believe that the moon is a man and the sun a woman and that the latter flies back to the east at night, unseen by all but the cleverest medicine men.⁶

To dwellers in the open veldt, day has its occasional dangers but the night is always threatening. Fire, then, is revered as the protector of life and the storm that beats it down is the work of a malevolent spirit. Among the Heikom there is a headman in each group to whom the fire belongs. Only he may manipulate the fire drill with which a new blaze is kindled. This drill is of the kind commonly in use among primitive people. The hard round stick which is rotated rapidly to make the friction is said to be male, the softer wood in which the flame is kindled, female. When camp is moved to a new site, the fire must not be transported there, but must be kindled afresh by the headman, and all other fires lit therefrom. The new fire must be brought into being

⁶ For these and various other myths the reader is referred to Schapera's excellent account in *The Khoisan People of South Africa*.

only by the hands that are worthiest, for only in this way, say the Bushmen, can its life preserving qualities be assured. A flame kindled by common hands would not be effective in keeping away the lions nor the spirits of the dead. It is noteworthy that in Australia, where there are no night ranging beasts of prey, the fire is not held in any special reverence.⁷

Fire is also connected, in the minds of the Masarwa, with the beginnings of life. To their minds there is an analogy between the spirit of man and a flame. When a woman is in labor the husband lights a small fire outside the hut and feeds it constantly. No one may cook meat or even warm himself at this blaze. While it burns the light of life will be kept alive in mother and child. Should it go out, death or blindness would result in one or both of them.

It is possible that some of these customs regarding fire may have been borrowed by the Heikom from their Bantu neighbors, the Ovambo. Among these people the sacred fire burns in the kraal of the chief and is tended by two old men. Should they allow it to go out a great disaster would follow. The fire is the life of the chief and only at his death is it extinguished. The new chief will light his own fire and from this all the other fires in the tribal place will be kindled. However, it is not at all unlikely that it was the Ovambo who borrowed this custom from the Bushmen.

Like all primitive peoples the Masarwa are firm believers in magic. Death is usually attributed to magic, the result of ill-will or the plotting of an enemy. Among some tribes a distinction is made between those who die easily, "a good death," and those who die in pain or convulsions; the latter

⁷ Thomson, however, has recorded that among the tribes of North Queensland fire has a special social significance. Marriage is signaled by the sharing of a fire and visitors from another tribe are welcomed with a gift of a fire stick. No man will visit another's fire, and so communications are shouted into the dark.

are those whose death has been encompassed by witchcraft. The instrument used for killing by magic is a miniature bow and arrow called by the Germans in Southwest Africa "the Bushman revolver." The tiny arrow was supposed to be poisoned and shot into a man's ear when asleep. The Bushmen, however, say that all that is necessary is to shoot an unpoisoned arrow against a man's kaross and when he wakes and finds it beside him he will speedily sicken and die. This is the same way in which death by magic is brought about in Australia, except that there the instrument is a bone or pointed stick which is jerked in the direction of one's enemy.

Hunting methods have been in part described elsewhere. A remarkable knowledge of the environment and its resources is shown by the several different ways in which the deadly arrow poison is prepared. One method is to take the milky juice of the euphorbia and mix with it the dried and powdered venom sacs of the puff adder, or, when procurable, of the deadly and vicious mamba. The Kalahari scorpion and the trapdoor spider also provide venom. But the most deadly poison is obtained in a rather peculiar way.

There is a small reddish brown beetle (*Cladocera nigro-ornata*) found in the southern Kalahari which lays its eggs on the branches of a certain shrub. The grubs finally spin their cocoons in the sand at the base of the plant. The body juice of this insect, both in the grub and cocoon stage, is a very potent poison. Bleek⁸ describes how the Naron prepare this poison by mixing the dried body of the insect with the sticky juice of the spiked cucumber or with that of the hakdoorn. This sticky substance is then carefully smeared on the arrow point, which for the hunting of small animals is made of bone or hard wood and fitted into a hollow reed

⁸ Bleek, Dorothea J., *The Naron, a Bushman Tribe of the Central Kalahari*.

so that it becomes detached when it strikes the animal. Dornan suggests that this is done so that the shaft may be used again, but is probably for the protection of the hunter himself. When not in use, the poisoned tip can be safely carried inverted within the hollow shaft, being taken out and fitted when required.

One can readily understand how stomach poisons are discovered by people who are reduced to using everything that is available in the way of food, for in their case experimentation is enforced. How they found out that the juice of the *ngwa* caterpillar, as they call it, is such a deadly blood poison is not so easily comprehensible.

Besides this animal poison, Dornan⁹ lists among the vegetable poisons *Euphorbia striata* and *arborescens*, *Acocanthera venenata*, *Buphane distichia*, *Strychnos toxifera*, *Strophanthus kombe*, *Digitalis purpurea*, to which Schapera adds an eighth plant, *Haemanthus toxicarius* (*Amaryllis disticha*). This impressive list indicates either a very long experience with the plants of the desert, or else considerable capacity for observation and experiment.

When hunting, the Bushman's object is to alarm the game as little as possible. Taking advantage of every scrap of cover, he endeavors to creep within close range of his quarry, then shoots his arrow and drops at once to the ground. The animal, seeing no enemy and feeling but a slight sting, runs but a short distance and then resumes feeding. After a little time the hunter takes up the trail and follows it until he finds the animal dead. With larger animals, such as the giraffe, a fixed arrow head of iron plentifully smeared with poison is used; even then it may be many hours before the animal succumbs. When night falls the tracker returns to camp and in the morning the whole group takes up the trail.

⁹ Dornan, S. S., *op. cit.*, p. 50.

The Bushman is extremely skilful in stalking game. One device is to cover his head with grass. A well-known cave painting at Herschel shows a number of ostriches approaching what appears to be another bird, but beneath its breast a bow and arrow are seen protruding. The disguise consists of a pad or saddle of ostrich feathers, which fits over the shoulders of the hunter, and the skin of the neck and head of a bird, through which a thin stick has been passed.

Thus concealed, the hunter's imitation of a strange ostrich approaching a flock is ludicrous in its perfection. He puts on a mincing, half-hesitant gait, turning the neck this way and that, as though doubtful of his reception. Indeed the performance may be so life-like that cases have been known where a cock ostrich has attacked the stranger and injured him severely by a kick from its powerful leg.

If meat should be scarce in the hot season and the hunter has not had opportunity to prepare fresh poison, he may elect to run the game down. Singling out a young animal from the herd he sets out after it at a tireless run, keeping up the pursuit hour after hour all through the heat of the day. After a time the young buck's hooves become soft in the hot sand and it falls lame. If the hunter wishes to add to his reputation he will endeavor to turn the animal in the direction of the camp so that it can be killed within reach of the huts. By thus running down one of the larger game he will prove that he is a good provider and hence will be looked on favorably as a suitor by a girl's parents. Before marriage, however, he must have passed through the initiatory rites, which often consist of other tests of endurance, such as dancing continuously for four or five days with a minimum of food and water.

The onset of puberty determines the eligibility of the girl for marriage and very important ceremonies are carried on

at this time. Primitive people everywhere regard menstruation with considerable fear and take many measures to guard themselves against the malign influence of a woman in this condition. At the root of this deep-seated distrust of a natural function seems to be the fact that it involves a flow of blood from an invisible and therefore a magical source.¹⁰ Blood is recognized as the essence of life and has mysterious properties; that drawn from the genital organs is supposed to have special potency. The Bushmen believe that if menstrual blood is mixed with an enemy's food it acts as a very powerful poison. If a hunter has bad luck during one of his wife's menstrual periods, he will not hunt again at such times. So much is this function feared that the whole group must be protected by special rites at the time of a girl's first menstruation.

For several days she is kept in very close seclusion in a hut built specially for her by her mother. She must on no account look at any boys or men; her very glances are dangerous. During this time the old women instruct her in her duties and responsibilities, how she must prepare her husband's food, remain quiet when he is cross and hungry, gather the veldkos, and bring water to the camp. She also receives some definite sex education. Finally all the women, assisted by two old men, dance the eland bull dance, some of the actions of which are decidedly suggestive. The girl watches this dance carefully, and next day is rubbed all over with grease and powdered *buchu*. Then she must proceed at a run to bring water to the camp, and likewise at a run, sets out to gather a load of firewood. This symbolizes her new duties and so she is finally inducted into the affairs and status of womanhood.

¹⁰ The Cape Bushmen had a dance which they called "Mokoma," the dance of blood, which was continued till blood ran from the nostrils of the performers.

Marriage is arranged through the parents. If the suitor is approved, the mother takes his weapons and places them in her daughter's hut where the young man goes to sleep. If the girl is unwilling to receive him, presents of bead work must be made and if these are accepted she may be carried off by force if necessary.

This necessarily brief account of Bushman life and customs ¹¹ may be ended by a description of how these desert people obtain their water. Scattered about the desert are some soakages and springs, the location of which is kept secret as much as possible. A favorite trick is to fill the tiny spring with sand, leaving a hollow reed pushed down into the water. Ashes of the campfire are then scattered over the place so that a more unlikely spot for a soakage could not be imagined. The Bushman women are very clever at sucking up the moisture by means of a reed at the bottom of which a little ball of grass has been attached. This is thrust into the damp earth and with infinite patience and labor the water is gently drawn up and siphoned through another straw held in the mouth into an ostrich eggshell. This feat has been witnessed and described by Passarge and more recently by Colonel Rey. The location of these soakages was kept secret since the Bushmen never knew when they might be forced to flee into the veldt and their lives be dependent on their knowledge of the whereabouts of water away from the known drinking places. It is of this water-sucking process that Sollas says, "It is often with bleeding lips that the Bushman thus provides for his suffering wife and family." ¹² As a matter of fact it is usually the women who do this work.

¹¹ We are indebted to Schapera for an excellent description of Bushman life, compiled from all existing sources. For a fuller account the reader should refer to his book *The Khoisan People of South Africa*.

¹² Sollas, *Ancient Hunters*.

When water fails, the Bushman, like all else on the veldt, depends on the tsama melon which the Bechuana variously call *bokhame*, *khengwe* or, as Livingstone spells it, *kgeme*. We saw too the yellow spiked melon or *mokopane*, the juice of which is also thirst-quenching. When we passed through the southern Kalahari the tsama melons lay thick on the surface, as it was a good year. With the melons plentiful, the game also had thickened so that neither Bushmen nor Bakalaghadi were ill-nourished.

Despite the poverty of their lot, the Bushmen did not appeal so much to my sympathies as did the Bakalaghadi. It seemed natural to regard the former, with Livingstone, as "the free sons of the desert" and their transient, carefree habits as inseparable from the conditions of their life. It is hardly necessary to expend pity on a people whose choice it is to live dangerously, who do not hesitate to pit their courage and resource against all that Nature can bring against them. Perhaps, as Bokhame said, they were also to be considered with the things of the veldt, which cannot be tamed or held captive. There is always something attractive about the independent life of the hunting peoples.

As regards the Bakalaghadi, the case stands differently. Like ourselves, they have given hostages to Fortune. Circumstances and not choice have placed them in the Kalahari. So they do not defy, but merely temporize with the desert. They build themselves homes, and wall themselves off as best they can from wilderness perils. They set up their little villages and seek to bring themselves under the constituted forms of society. They sow their poor crops and look forward, though with fear and misgiving, to harvest. They attempt by all means in their power to anchor themselves in this wilderness. They are men like ourselves, not things of the veldt, and, perhaps, the more to be pitied.

CHAPTER IX

JOURNEY TO NGAMILAND

At Khutse Pan we made another check on our gasoline supplies and I finally decided that we should turn back for Molepolole and take the northern road to Maun, the administrative center of Ngamiland. Even if we reached Ghansi in safety we might fail to get into touch with natives on the way.¹ Bokhame told us that west of us was a land where the Bushman was king, and that those of the Bakalaghadi who had business in that country went warily, with great respect for the Masarwa and their poisoned arrows. With such an independent people it might be very difficult to make contact, and our meagre supplies of water would not allow us to tarry on the way. Besides these uncertainties of the journey, I had already looked over a sample of the southern Kalahari and I wished to judge for myself of the environmental conditions further north. So we gave Raumkavideo his blanket, made a final presentation of tobacco leaf and handkerchiefs to our Bakalaghadi and Bushman friends and set off.

Thanks to a headwind that cooled our engine we made better time back to Lunakie, where we found all our surplus goods safely stored. In due time we reached Motate, where we saw a herd of about a hundred springbok on the pan; but

¹ Our decision to return was indeed fortunate. Mr. Knobel and his son Louis have since accomplished the feat of crossing the desert in two light cars. From Qusi Pan on there was no road and they were dependent on Bushman guides. Sixty miles from Ghansi they had to leave one car and push on with all the available gasoline, eventually reaching a Boer farm with one cup of gasoline left. From there help was sent back to the rest of the party.

mindful of the fact that Schwarz had called the road between Serowe and Maun the worst in the world, we did not dare delay on this part of our journey but hurried on. We met only one traveller, a native jogging along on a wild-eyed, long-horned riding ox of the kind employed by Galton and Andersson on their journeys into the Kalahari from South-west Africa.

At Leclaka, half-way back to Molepolole, we met natives and at their request drove off a couple of miles into the veldt to visit a man whose foot had become infected from what was said to have been a wart on his sole. We found him living in a miserable shelter of bushes near a kraal. He had once, according to Knobel, been rich in cattle, and therefore highly respected, but, like Job, afflictions had fallen upon him. With his disablement had come the death and sickening of his stock and he was now in direst poverty, living outside the kraal and attended only by his two daughters. Whether this Kalahari Job had his native comforters I cannot say. We were able to give him little consolation.

His foot was much swollen and when the filthy rags were removed so that the doctor could make an examination a terrible sight came to view. The festering sore was so large that only amputation of the foot would be of any use. The only thing that the native could do was to set off for the hospital at Molepolole, riding on a donkey with one of the women accompanying him. Even if the operation was successful, the outlook for him was discouraging indeed.

The desert is no place for the maimed or disabled, whether they be animal or human. It is easier, perhaps, on the animal, for in its case death does not linger. This man was already an outcast, committed to the rather unwilling attention of the two women. Perhaps the psychological key to primitive man's indifference in matters of this kind is that

so little can be done for the alleviation of suffering. Onlookers, no matter how engaged by affection, must perforce stand by helpless. The mental discomfort associated with unavailing pity may, however, be relieved if it is transmuted into blame or anger. So the sufferer is regarded as accursed, either as the result of his own transgressions or as the victim of another's malevolence. It is easier then to pay the debt of loyalty or affection by hunting down the supposed magic-worker than to give the patient the care that his condition demands. The unfortunate one is considered beyond the pale, to be avenged but not helped. All that we could do for Job was to ensure that the attempt was made by the natives to take him to Molepolole.

The next day we arrived there ourselves and after a day to repack we set off back to Gaberones and then north along a road that for some distance paralleled the railway line from Mafeking to Bulawayo. For the two hundred and ninety miles of the journey from Molepolole to Serowe, we were in Bechuana territory. That we were still on the fringe of the Kalahari was brought to our minds when we reached the little wayside station of Debeete, where the road leaves the railway and swings to the east. The stationmaster told us that he had been much disturbed the night before by the roaring of a lion that had come so close that a dog at a hut a hundred yards from the station had fled inside, adding to the terror of his native master.

Though we camped in a thicket that would have made an ideal ambushade for any marauder, we were not disturbed. As a last precaution I backed the truck up close to the fire and served notice to my companions that if the lion had much to say during the night I intended to take up my bed and *jump*. If they wished to stay outside and continue the discussion I had no objection, but the doors of the truck

would not be open long. However, we had no alarms, and certainly no excursions far from the fire. It seemed to me that once or twice when I woke up and looked around, the high grass in the thicket wavered suspiciously, but I put that down to imagination and moonlight. In the morning as we drove out there were the tracks of two lions that had walked side by side in the dust of the trail. No doubt we had been well looked over during the night.

Serowe, in spite of its supposed thirty thousand inhabitants, was almost as loosely strung together as Molepolole, although in the center of the town there was some semblance of streets, along which groups of women, dressed in gaily colored shawls, went to bring water from the wells. What impressed me most in Serowe was the collection of old covered wagons outside a blacksmith's shop. Our car, still trim and neat, drew up alongside one of these, and the contrast of the new and the old mode of transport was striking. As I looked at the gaunt old wreck, with its felloes cracked, its floor planks gaping and its rusty iron ribs arched over its sun-warped body, I wondered what stories of human endeavor could be told about such an old schooner of the veldt. So many dusty desert miles it had creaked over; so many cargoes of human hope and folly it had conveyed; so many Kalahari nights it had stood on the veldt, the lions and hyenas circling around, trying to stampede the oxen. It was easy to imagine one of its desert journeys, part of a wagon train strung out across the seemingly endless desert, the cattle straining forward, their sides caved in by a four day thirst, the drivers struggling on beside them wielding the lash, with grim disaster dogging their steps. No argosies of wealth or good fortune these, but sad reminders of those whom the desert swallowed up, or turned back in defeat.

The first two hundred miles which we travelled from

Serowe into the desert has been from Livingstone's time one of the most dreaded, waterless stretches for wagon transport in South Africa. The sand is particularly heavy and the only place where water can be relied upon is at the wells of Lotlekane in the middle of the journey. The reader might perhaps get some idea of the nature of this country if he understood the pains that travellers endured in crossing it. Hodson, an experienced Kalahari traveller, gives an excellent description of how a hundred mile "thirst" may be traversed.

The wagons are driven out for twenty miles, the oxen outspanned and then driven back to the starting place for water. There they are rested for a couple of days and then driven out again to the wagons. Arriving there in the evening they are at once inspanned and for two nights are rushed forward, travelling only after sunset so as to conserve their energy and avoid the heat of the day. Livingstone tells how in such circumstances the thirsty animals gather round the wagon which carries the men's drinking water, snuffing the smell of the moisture.

After the second night, eighty miles of the journey having been compassed, they are unyoked and driven forward the last twenty miles to water. Then after three or four days' rest to recover their strength, they must return to the wagons which are brought in the following night. Thus one hundred and eighty miles have actually been traversed by men and oxen.

Once we were on the trail we found that it richly deserved all the hard things that had been said about it. Hoof and mouth disease had broken out among the native cattle of the Maun district and Colonel Rey had sent in some heavily laden trucks with supplies to Maun which lay four hundred and fifty miles ahead of us. These trucks had literally wormed their way across the sandy plateau and had cut deep

tracks. This would not have been so bad but every twenty yards of the track had a sudden twist in it. The racking strain as we threaded these serpentine windings and turns can hardly be described. We were three men unequally yoked together on two seats. The doctor, as the sportsman of the party, had the outside berth, which left me wedged in between the two seats, with a scant anatomical hold on both. Sitting from eight in the morning till ten at night in such a position on such a road was the most painful experience I had in Africa. As for Sally, our truck,² having neither knee nor hip action, she made her way with squeaks and rattles in every part of her protesting frame.

Plugging along at eight miles an hour, with no rest save when we stopped to cool the boiling radiator, we finally dropped off the low plateau and crossed the valley of an extinct river, the Moroko. Here we were hailed by a native who asked us to do something for a boy who was dying. We found him lying covered with a skin kaross and shaking with the ague of malaria. The doctor gave him quinine and aspirin and we made ready to proceed.

The natives lined the track, softly clapping their hands in token of gratitude, and just as we started, the kaross was put aside, and the boy, thin and feverish-eyed, rose to his feet and clapped feebly with the rest.

"Ay *More*" (master), cried the mother to Knobel, "the child is better already." We sincerely hoped so, for there was a seventy mile tramp ahead of the little chap before he reached Serowe.

Late in the afternoon we came to Lotlekane, "the place of the little reed," famous in this part of Africa for the terrible disaster that occurred there. "Everybody," says Schwarz,

² The truck's name was really suggested by the book *Sally of Rhodesia*. We saw no reason why the Kalahari should not also have its Sal.

"who has been in the northern Kalahari has touched at this place. From Oswell and Livingstone onwards, it is the one bright spot in the most infamous road in South Africa, the two hundred miles 'thirst' between Mopepe and Serowe. Along it the Trek Boers, seeking their land of Goshen, perished in hundreds in 1879. The cause of the disaster was the overloading of the wagons for such roads, the unfavorableness of the season, but above all the total want of organization. Three hundred wagons with thousands of oxen assembled at the drinking pools, which would only suffice for four or five spans, with the result that the water was exhausted, leading to bitter quarrels. One will never know the toll of human life taken by this trek, but the more resolute, assembling the best animals, whipped up their teams and managed to reach the Botletle. For years afterwards, the land was littered with the debris of the abandoned wagons, and the skeletons of the dead oxen lay by the wayside."⁸

Across the desert still live some of the descendants of those who survived. For those who won through there was no promised land flowing with milk and honey, but Ghansi, a niggardly reward for such an heroic pilgrimage.

For the rest of our journey through the Northern Kalahari, we were following closely the course of Livingstone's first great journeys in Africa. Natives had brought to Moffat, Livingstone's father-in-law, reports of a great lake called by them Mampoore which the missionary longed to visit. One day he was telling Sechele, chief of the Bakwena, of God's command to carry the gospel to every creature. Sechele waved his arm towards the encircling desert. "How can that be?" he asked. "How can the word of the tribe of God travel across that desert? It is impossible for us black people to cross it except when there is much rain and the

⁸ Schwarz, E. H. L. *The Kalahari and Its Native Races*, p. 129.

melons lie everywhere on the face of the desert. Even we, who know the country, would perish without them. This talk of God's town in the sky amazes me. If it is true, why did not my father hear of it? And why should the men who live beyond the desert die without knowledge of it?"

Here was a double challenge, first to the explorer and then to the missionary—an unvisited lake and an unknown people. Thus began Livingstone's expedition in search of Lake Ngami, the first of many journeys in Africa. On one of the earliest ones in this very stretch of country he and his family nearly perished.

Twelve miles beyond where we camped was Choukoutsa Pan, destined to be well known to the explorer for he crossed it four times. It was a vast white expanse of salt broken only by some dark islets of vegetation some miles across its surface. Livingstone's description fits it very well today.⁴ It lay under the same cloudless skies as when he saw it, with the same "glaring effulgence" from its lime and salt encrusted surface. The same mirages that misled his party and sent men and oxen rushing for the elusive water, flowed over it; only, instead of zebras increased to the size of elephants by the heat haze as he records, we saw herds of springbok similarly magnified. We tested their speed across the pan and found that forty miles an hour made no appreciable gain on them.

The lives of the explorer's party were probably saved by a Bushwoman whom Oswell saw stealing across the pan and whom he pursued on horseback and captured. When she found she was not to be killed she showed them some water but it was not very palatable. "Of bitter, bad, disgusting waters," writes Livingstone, "I have drunk not a few nau-

⁴ Livingstone, D. *Missionary Travels and Researches in South Africa*. London, 1857.

seous drafts," but the water of Choukoutsa it seems capped them all. As he politely put the matter, the fluid "presented indications not to be mistaken of having passed through animal systems before."

The bare chronicling of these experiences conveys but little of their fearful quality; of the emotional strain of anxiety, the physical weariness, the insufferable tardiness of approach. On these vast plains the traveller sets some inconsiderable goal, such as a bush or a tree, perhaps half a mile ahead, only to find in its overtaking no sense of achievement, but only a mark from which to begin the seemingly endless struggle all over again. Add to this weariness the manifest suffering of the dumb oxen, now in such straits that pity itself must ply the lash, and you may gain some conception of what such a journey costs.

However, to dwell on the hardships of the early travellers in the Northern Kalahari may result in the reader having the impression that all was a barren waste. This, however, was not the case. There was considerable vegetation, except near the pans, and in some places a low thick forest of brush, indicating a sufficient rainfall; it is only the absence of surface water which made this country so difficult to traverse. Ngamiland lay ahead; there the Okovango river system provides water with the result that it was and in some parts still is, the greatest hunting ground in Africa. Elephants were so common that at one time native hunters left their tusks to rot with the rest of the bones on the veldt or carelessly stuck them in the ground to serve as poles for their stockades. Andersson,⁵ who travelled this region in 1857, tells of one hunting party of whites who killed nine hundred elephants in a single season. His own book is full of adventures with rhinos, lions and elephants in this country.

⁵ Andersson, C. J. *Lake Ngami*. London, 1856.

Very little more need be said in description of the country which now lay between us and Ngamiland. We rolled along over an immense dusty plain on which stands Mopepe, a little settlement with one white inhabitant. There were many small herds of springbok but little other game to be seen. Though it was midwinter, the sun was hot, and huge whirlwinds, like pillars of cloud, moved in constant procession across the plain. We saw no less than five at the one time.

Mopepe is on the edge of this bare, sun-smitten plain—a dreary expanse broken only at one point by a palisade of river reeds surrounding a native kraal; yet, as if denying relief to the eye, this, too, was the hue of summer, a sun-bleached yellow. How the place endures the full burden of the summer sun is beyond all comprehension.

Our visit there was of some interest because of two circumstances—the first a freakish feat of memory on the part of Ingleton, the white trader who recognized and called Knobel by name, having taken him prisoner in the Boer war, thirty-four years before, though he had not seen him since. Possibly he had seen so few white faces since the war that remembrance was easier. The other thing that impressed us was a collection of twenty-three huge spotted hyena skins, killed by Ingleton within a month, showing that game must be plentiful.

Beyond Rakops we reached the valley of the Botletle, but after following it twenty-six miles we turned away from it to cross the Haina Veldt, thus cutting off an eighty mile loop in the river which we would rejoin at Makalamabede.

We had been advised to load our truck with firewood before leaving the valley, as the Haina Veldt was said to be treeless and lions were particularly troublesome. We had scarcely finished doing so when we were invited by a party of Da-

maras to turn back and shoot a lion that had been caught in a trap.

We were just about to unload and turn back when the old Damara headman arrived and counselled us to go on. The young men had omitted to mention that we should have to tramp some miles on foot and spend the night on the veldt; also that the lion had got out of the trap and was probably in a most ferocious temper so that he would charge the party on sight. The headman himself was going to set out in the morning and would be glad of our company and support, but if we were in a hurry, he would advise us to go on.

This disinterested advice was somewhat surprising as coming from a native, but the Damaras seem quite superior in intelligence to many other tribes. They are refugees from Southwest Africa where their tribe fought most bravely against the Germans in 1911; after its final defeat many of the survivors moved into British territory. Among the other natives they bear a rather ill reputation as cattle thieves. This may be deserved, but we formed a very favorable impression regarding them, an opinion which was decidedly confirmed by the events of the following day. Though the story does not concern the Bushmen particularly, it may be told as illustrating the dangers incidental to lion hunting and the courage of the natives.

We had spent the night on the Haina Veldt with our heads laid close to a thicket of thorn bush and a good fire at our feet to scare off the lions and next morning had driven at snail's pace over the worst road in Africa, the track to Makalamabede. The sand was very deep, but this was not all. There were no trees but the thick roots of the scrub grew right across the track and as the sand was gouged out beside them a series of wicked potholes was left, each of which

threatened disaster to Sally's springs. The sight of a couple of giraffes, one or two jackals and dozens of black and white knorhaans and, near the river, guinea fowl, doves, hornbills and weaver birds in scores had broken the monotony of the journey. At last we caught our first glimpse of water in the bed of the Botletle and just as we rolled down beside it killed a three foot puff adder, a sluggish but extremely venomous reptile. The river was not flowing, the pools being left over from the previous year's flood. The sand was deep and it was only by deflating our tires to about fifteen pounds pressure that we were able to progress at all.

About four in the afternoon we were rolling along towards the ford over the river at a distance of about sixteen miles from Maun when to our surprise a white man stepped out of the bush and hailed us.

His first words were a query as to whether we could carry a couple of passengers to Maun. He then explained that he had two boys in his camp who had been badly mauled by lions. When he saw our load he withdrew his request, saying that he would take them in his own truck. To the doctor's offer of medical assistance he eagerly assented and led the way down towards the river. On the way he explained that his name was Johnson and that he and his son had taken the contract to cut a new track to Maun. Lions had been keeping them awake at night and had taken eight of the Damaras' cattle; so when the natives came to the camp for help young Johnson accompanied them on the trail of the marauders. The news had just been brought that there had been a serious misadventure.

Under the shade of a tree we saw a man with a bandage round his leg and just at that moment another rode in on a donkey supported by men walking alongside.

I have rarely seen a more terrible sight. He was a Damara chief named Gaeba and as was the custom among the chiefs was dressed in European shirt and trousers, now thoroughly soaked in blood. His left eye had been torn from its socket, his left cheekbone and lower jaw bone broken, his forehead gashed to the bone, and his right forearm mangled terribly. In addition there were the marks of the lion's teeth on his scalp and the flesh of one shoulder had been cut to ribbons by the creature's raking claws. While the doctor examined the wounds we got the full story from young Johnson.

They had followed the lion at midday, knowing that it would not travel far over the hot sand. Johnson got a shot at it in some brush but only wounded it in the forepaw. While it raged furiously up and down in the thicket, one of the men, a noted lion hunter, ran to one side to try for another shot. The lion saw him and charged, but as it sprang at him the native threw himself headlong under the lion so that it missed him. In the meantime the rest of the natives ran away, leaving Gaeba, who was unarmed, to stand his ground beside the white man.

Seeing them the lion continued its charge. Three shots were fired without stopping the animal and just as it reared on its hind legs to spring on Johnson, Gaeba stepped forward and took the lion full upon him. In a flash it had the chief on the ground and was shaking him like a dog worries a rabbit. Johnson fired three shots at point blank range before the lion rolled over dead.

Streaming with blood, Gaeba jumped to his feet. "Are you all right, Baas?" was his first question. "Are all my people safe?" was his next enquiry. Only when he was satisfied as to the safety of the rest did he think of himself. "Will I live, Baas?" he asked.

Johnson looked at him and saw he was terribly injured. "Yes," he said, "I think so—if we can get you to the white man's hospital in Maun."

In the meantime one of the natives who had run away turned round and fired in the general direction of the lion and put a Martini-Henry bullet through the calf of the other man's leg.

There was little that the doctor could do for Gaeba except to give him some morphine to deaden the pain. Next day we visited the wounded man in the native hospital at Maun. He lay on the mud floor, his head supported on the lap of his wife, his blood stained clothes still upon him. His head was swathed in bandages and as the fever rose he would reach round with his uninjured hand groping in most pathetic fashion for his wife's hand, and clinging to it as if for support. As is so often the case, the lion's claws were septic. The infection travelled rapidly along the eye socket to the brain and the next morning the brave fellow died.

Two days later we saw Johnson at the missionary's house in Maun. He was very much shaken. He would say over and over again, "That man was a hero. He gave his life for me. He was the bravest man that ever lived."

I expect it was some time before Johnson fully recovered from an adventure which would have shaken the nerve of anyone, even the hardest. To see death's agonies at such close range and to know that except for his self-sacrifice, the dying man's sufferings would have been your own would make the occurrence distressing beyond all ordinary measure. If by this incident alone, Damara courage is well attested throughout Ngamiland.

CHAPTER X

THAMALAKANE VOYAGE

THE Botletle, because it changes the whole character of the Northern Kalahari, is of great importance and is at the same time one of the world's strangest rivers, being the only stream, other than a tidal river, whose waters flow in opposite directions. It has two mouths, but no source. One mouth is in the reed bed that was once Lake Ngami and the other two hundred and fifty miles in the opposite direction in the Great Makarikari Salt Pan system of which Choukoutsa is a part. The bed of the Botletle really lies along a shallow trough which is filled from another river, the Thamalakane. This trough has a hump in the middle just where the Thamalakane enters it, which accounts for the Botletle flowing two ways.

The Thamalakane itself is filled by the overflow of the Okovango swamps, a great marshy area into which the Okovango empties. How far the water will flow down the Botletle is dependent entirely on the size of the floods that fill the Okovango. In 1925 Schwarz paddled down stream to Lake Ngami, and then turned round and paddled, also down stream, from the junction of the Thamalakane and the Botletle, to Mopepe in the opposite direction. The year before our trip the water had flowed only as far as Makalamabede.

At the time of Livingstone's visit, the banks of the river were so lined with elephant pits that his oxen could not reach the water without some falling in. The Bushmen dug these

pits about six feet deep and roofed them with a light covering of reeds and earth. Each pit was made narrow at one end so that a small elephant would wedge itself in. Sometimes a sharpened stake was set in the middle or a transverse ledge left so that with fore and hind legs on either side the animal could not struggle out.

Andersson's adventures in these parts make thrilling reading. What with elephants and rhinos and twenty foot pythons on the river banks, giraffes standing seventeen feet high on the veldt, and hippos and fourteen foot crocodiles swimming in the pools, this must have seemed like the last gathering place of earth's most gigantic animals.

Maun, which we had now reached, is the capital of the Batawana, a branch of the Bamangwato, who under their chief Tawana, "the little lion," made their way west and took this country, enslaving its original inhabitants, the Makoba or Bayeye. Tawana's people prospered so that Lobengula, the Matabele king, was informed of their herds of long horned cattle and sent his impis across the desert on two occasions to despoil the people.

For the second invasion the Batawana were prepared. Bushmen watched the desert and carried news of the Matabele approach. Hearing of their great numbers and fierceness, Moremi, who was then the Batawana chief, and his men withdrew into the marshes. They built a bridge of reeds and crossed with most of their cattle on to an island. The Matabele, who drove a herd of cattle with them which they might use for food in a long campaign, came slowly on. Nine days after their arrival they proceeded leisurely to the job of exterminating the Batawana. But some of the latter had procured firearms for which they had traded elephant tusks. The reed bridge to the island broke down, those of the Matabele who could swim were shot down as they reached the

bank and the crocodiles finished the rest. Never did the river provide such a feast and it was in that year that most of the biggest crocodiles got their growth. Few of the Matabele escaped into the desert and those who did perished of thirst. The wilderness had been too much for them and no Matabele army ever crossed it again.

Maun, as the only white settlement in Ngamiland, deserves a word of mention. In 1923, according to Captain Stigand, administrator and explorer of this region, its white population numbered only thirteen but as the administrative center of a country of forty thousand square miles, it stands out boldly on the map. The total number of white residents in Ngamiland cannot be more than one to each thousand square miles. In our three hundred and fifty mile journey from Serowe we met all the permanent residents along this stretch—the trader at Mopipi, the police sergeant at Rakops, the young man who kept the store at Makalamabede. Compared with this scarcity of inhabitants, Maun seemed quite a metropolis.

Schwarz, who travelled this country in furtherance of a rather nebulous scheme to divert Zambezi water into the Okovango in the hope of refilling the pans and bringing about a change in climate, has this to say of Maun.¹

"Ngamiland is the Never-Never land, into which people drift and can never shake off its grip on them afterwards. It provides them with a living and no more; any exertion on their part brings its own punishment—memories of the outside world, and in Ngamiland one must not think." Nor is his opinion of Maun more flattering. "The town is a collection of reed huts, within their palisades of more reeds. All around is deep grey sand, through which one flounders

¹ Schwarz, E. H. L. *The Kalahari and Its Native Races*. Witherby, London, 1928.

from place to place, for the huts have been built without any regard to symmetry or the convenience of streets." Colonel Rey is even less generous in his comments, for he calls Maun "one of the most unpleasing native villages it has been my lot to visit. Not a blade of grass, not a vestige of green, relieved the dirty, sandy, arid space, over which the village straggled . . . and the general effect was appallingly depressing."²

But if Maun is depressing, the Thamalakane River is not. It loiters rather than runs by the doors of the Maunites but not so close that the residents will be disturbed at night by the roaring of the bull crocodiles in the mating season, or in the day by the shrieking of native visitors who, prior to the building of the causeway over the river, used to perch on ant hills on the further bank and clamor for days to be ferried across. When the townsfolk had business on the other side they paddled over, but not till then. In the meantime the visitors could exercise their lungs or go fishing, just as they pleased.

In some respects the Thamalakane is like the Fitzroy in northwest Australia—a river of life in a wilderness where other water is hard to find. Its quiet reaches are reed-enfringed, as placid as any pond. In the late afternoon, if you watch carefully, you may see the surface gently broken by a pair of knobby protuberances, that are a crocodile's eyes. Now and then the water lily leaves are set awash by the splattering of the waterfowl as they go visiting their friends among the rushes. After weeks of plugging through the Kalahari sand, scrub, and pans, in a land where water must be conserved in spoonfuls and guarded as carefully as life itself, it is a real joy to come upon pools deep enough to

² Rey, C. F. "Ngamiland and the Kalahari," *The Geographical Journal*, Vol. LXXX, Oct. 1932.

defy the sun's cruel power, and wide enough for the breezes to play across their surface and send little wavelets lapping among the reeds.

Fifty yards beyond the river's banks stretches a forest of mopane, a rather low tree with bright green leaves belonging to the *Bauhinia* family. Right at the very edge of the banks are found the mokuchon and motsweri, fine spreading trees giving excellent shade. Down below is a little grassy flat and beyond that a tangled mat of weeds. Fringing the deeper water is the army of the reeds, a convenient hiding place for the crocodiles, which lie in wait for the Batawana goats and cattle as they come for their evening drink. The cool of the deeper water is so inviting that every now and then some unwary beast wades in. There is a sudden swirl in the river, the animal is seized by the nose and to the accompaniment of wildly thrashing water is dragged under and drowned. Occasionally, a native woman intent on her washing forgets how quietly a large crocodile can make his underwater approach and suffers a similar fate. Probably more people in Africa are taken by crocodiles than by any other wild animals.

The parallel between the central and northwestern Australian environment, on the one hand, and that of the southern and northern Kalahari on the other is made more complete by the presence of the Okovango and its overflow streams, the Thamalakane and the Botletle. Due to the presence of these rivers the Northern Kalahari presents the same contrast to the country in the south as the Kimberley districts do to Central Australia. As I was very anxious to see for myself the living conditions obtaining in the Okovango region, we made a nine day trip into that mysterious country where very few white men have ventured. Because of that fact, and of its importance to my comparison of the two

selected environments, it is worth while to devote some space and time to the attempt to picture its main features for the reader.

It is indeed a strange land. The Okovango is a deep, swift flowing river that comes out of the great spongy morasses of Angola in Portuguese West Africa. Then it suddenly debouches upon a vast depression one hundred and fifty miles long and one hundred miles wide. This has been only very partially explored and indeed there is no record of any white man ever having traversed the whole of it. Andersson went several days' journey into it along the Teoge River, one of the branches that once fed Lake Ngami, but did not penetrate far. Captain Stigand has carried out the most extensive exploration and has published the best sketch map³ of this region. The surface is studded with hundreds of islands between which are huge reed beds traversed by a veritable maze of watercourses large and small. On these islands are to be found lions, giraffes, buffalo, rhinos and various kinds of antelope in large numbers. It is doubtful indeed whether any area in Africa, outside the reserves, has so much game. This natural sanctuary is protected against invasion by the difficulty one experiences in threading the streams, by the fact that there are no native guides who know the whole area, by a wide belt of tsetse fly country, and lastly by the hippos.

Strangely enough, the hippopotamus, elsewhere one of the most inoffensive of the wild animals, is here just the reverse. This unenviable reputation of the hippos is long established, and there has not been a single exploring expedition from Andersson's time onwards but has had its boats fiercely attacked by these huge creatures. This explorer had one of his boats upset by a hippo and he also records meeting a party

³ Stigand, A. G. *The Geographical Journal*, Vol. LXII, Dec. 1923.

of hunters who told him that one of their number had been killed during the hunt.

Just twelve years before our visit, Stigand while exploring the Ngoga River, another Okovango branch, had an exciting experience. "My flotilla," he writes, "consisted of a 25 foot aluminium boat and two well made native dug-out canoes. Travelling up the Ngoga and down it, not one of the craft escaped the attentions of hippos; first one canoe was cap-sized; later, returning down-stream, the other was entirely sunk in eighteen feet of water—in each case the Makuba crew of two, diving like otters as they always do on such occasions, had reached the papyrus bordering the channel in record time. Finally the boat was torpedoed, a couple of holes being knocked through the soft aluminium below the water line aft. But fortunately these were pluggable with rags and an island chanced to be within a quarter of a mile, where the boat was run ashore. In each case, the hippo attacked, and retired submerged without exposing itself to a shot." ⁴

Colonel Rey also records that Ellenberger who carried out the most recent survey of the river system encountered on one day thirty hippos, who, as he says, "manifested strong feelings of dislike to their visitors; the steel boat was damaged, had to be beached, and was put out of action for some time, and one of the canoes was sunk; the occupant saved his life by swimming to the shelter of the papyrus beds." ⁵

A little more than two years ago a government barge, carrying supplies to a working party who were engaged trying to clear a passage of reeds so that the water could come more directly to the Thamalakane, was attacked and sunk. But this was by no means an unmixed evil. Government

⁴ Stigand, A. G. "Ngamiland," *Geographical Journal*, Vol. LXII, p. 409, Dec. 1923.

⁵ Rey, *op. cit.*, p. 294.

property in Ngamiland must always be accounted for or be paid out of the officials' salaries. Consequently, lost property is simply carried forward from year to year on the inventories. The sinking of the barge was too good an opportunity to miss. Rifles, files of papers, office equipment that had been missing for years were reported "sunk by hippos in the Okovango swamps." What these things were doing there nobody enquired. There is no doubt that Behemoth is a most effective guardian of the marshes.

Having obtained permission from Captain Potts, the resident magistrate, to enter the area, and having borrowed the one remaining vessel of His Majesty's navy in these waters—a leaky, flat-bottomed boat—we set out to secure paddlers. We obtained a promise of these from a Batawana headman named Matseoakhumo—"town of great wealth"—and for the gift of a good blanket he agreed to accompany us himself as guide. Though we did not know it, he had been Stigand's guide on the Ngoga expedition twelve years before. Then we returned to Maun to stock our boat and await our paddlers, whom he promised to have in Maun the next day.

Our craft was old, leaky, and very heavy, but being flat bottomed was suitable for pushing through the reeds. It was sufficiently roomy to hold ourselves and our supplies, and bulky enough, so we were assured, to be safe from the attacks of hippos, a risk that in our ignorance we took rather lightly. Our goal was a place called Tsubaora ⁶ on Mathibe's Island where there was supposed to be a large village of Bushmen and which we might expect to reach in three days. This with a day to come back down stream and another day on the island would make a period of five days' absence.

⁶ This was the name given by our Makuba guide. There is a Chubaora marked on Stigand's map on the other side of Mathibe's Island. The island itself is sixty miles long.

Hitherto, we had overloaded ourselves with supplies and as there would be little room to spare when ten men with our cameras, blankets, food and my instruments were stowed on the barge, we decided to travel very light. A couple of pounds of bacon, two tins of condensed milk, a tin of jam, three loaves of bread, some dried bread or rusks, three packets of crackers and tea, sugar and coffee made up our stock of provisions. For the natives we carried two hundred pounds of mealies, the daily ration for each paddler being two pounds, and for wages one shilling.

As is usual, the paddlers did not arrive in Maun until a day later than Matseoakhumo had promised, and it was not till afternoon of that date that we were able to make a start. Madomo, an old Makuba river man, was in charge of the party, the arrangement being that the headman was to join us at the junction of the Thamalakane with the Santantadibe, one of the larger river's feeders which came directly from the swamps.

Madomo, accompanied by one companion, led the way in one makora, as the natives call their dugout canoes, and was followed by another canoe containing Sakoi, a Basuto trooper whom Captain Potts very kindly assigned to my service. These makoras are about fifteen feet long, eighteen inches wide, and pointed at each end. They are propelled by paddles where the water is deep, and in other places by twelve foot poles forked at the lower end to prevent them sticking in the mud at the bottom. Considering that there is only about six inches of freeboard above the surface of the water, it takes remarkable skill and some daring to propel these canoes through water swarming with crocodiles, where the consequences of an upset would be disastrous. Nothing could seem more graceful than the action of these Makuba as they stand one at each end of the canoe. The pole slants

backwards, the boatman bears down with all his weight, transferring his grip to the end of the pole with a hand over hand movement; then as his arm and thigh muscles ripple with effort, the makora shoots forward, the hands slide down the recovered pole and the boatman stands leaning as before, poised for the following thrust.

The knack consists of getting the last ounce of power at the last moment before the pole is withdrawn; and this demands perfect balance and coördination. The novice is apt to find himself clinging to his pole stuck fast in the mud bottom, with the canoe upset or gone on without him. The crocodiles do a great deal to raise the standard of makora paddlers.

It is unnecessary to present more than a few fleeting glimpses of that first afternoon's journey. The river itself, the rhythmic dip of the paddles, the unchanging sky, the smooth water and the all-surrounding green of the reeds together made a background against which the passing incidents of the trip were projected. There were the flocks of wild ducks rising at every turn in the stream, the wild geese in pairs; the little waterfowl, coots and terns, that splattered about in the shallows, or flicked their tails impudently as they walked lightly over the broad lotus and lily pads. Egrets sprinkled the banks with white or were thrown up in flight as a snowy cloud against the dark green wash of the papyrus. And always we were flanked by the squadrons of the reeds, alternately advancing and retreating, now constricting the channel to a narrow lane, now withdrawing into quiet bays. Occasionally, as the water-way swung close to the bank, we would be passing great trees, close enough to see little squirrels, hardly larger than chipmunks, scurrying up the trunks, or an occasional grey ape peering at us from the branches. As the evening drew on, the air was vibrant

with the nesting calls of wood doves and pigeons, or with the strident cries of the Kalahari pheasants.

We camped in two parties under the trees at a spot about fourteen miles from Maun, and after supper walked down to the river bank with our flashlights to see a crocodile's eyes shining like twin electric light globes in the water. Our men were very happy at their fire roasting a couple of geese that we had shot for them and boasting among themselves how they would kill pythons in the swamp and sell us the skins. Madomo, of them all, was the only man who had penetrated any distance into the marshes.

The boys had swept a spot clear of grass and twigs for our blankets and that night I lay watching the African moon steal along a branch of the motsweri tree overhead. Behind us stretched a forest region that ran unbroken by road, track, or white man's habitation for four hundred miles or more to the borders of Southern Rhodesia, while before us lay the untamed Okovango wilderness. Then as if to remind us that this was Africa, from a little kraal hidden somewhere in the forest rose the shrill, high pitched chorus of women singing for a moonlight dance.

The next morning at dawn, Sakoi, the Basuto policeman, went ahead with one makora to pick up Matseoakhumo at the Santantadibe junction. Our more leisurely progress next day gave us time to take stock of our crew.

Madomo and his companion were, as I have said, Makuba or Makoba, as it is variously spelled. These are river people who have been for a long period subject to the Batawana. Dornan and Hodson, both of whom knew the northern Kalahari people, insist that they are Bushmen, the latter being responsible for the statement that the Makoba "have the same customs as the Masarwa and are without tribal organization, and are as much serfs of the Batawana, amongst

whom they live, as the Masarwas are of the Bechuanas." On the other hand, it is known that they at one time possessed herds of cattle and still practise agriculture, though most of their living is gained by fishing and hunting. However, considering their present mode of life, they have probably as much right to be classed as Bushmen as have some other tribes such as the Madenassena. They were known to Livingstone as Bayeye and he comments on their unenterprising and rather pusillanimous nature. Andersson also gives them a bad character as thieves and vagabonds. If Madomo and his companion are to be considered typical Makubas, then aspersions on their honesty or courage are certainly not deserved, as our experiences will show.

Our boat crew of seven was a polyglot group as regards tribal representation. In the bow were two Masubeia, also subject to the Batawana. One of them was short and stockily built with evidently considerable Bushman blood. The other was tall and slender with a narrow face and high cheek bones; each was naked except for a thong between the legs and a hyena skin cap. Directly behind them stood a youth belonging to the Mambukushu, a third river tribe. He was the only lazy man in the party and dipped his paddle in such a ladylike manner that he contributed but little to our progress. He was always ready to stop work and turn round to hold a conversation with the paddlers in the stern.

"Are you a chief's son?" Knobel asked him one day.

"Ra?" said the boy. (This means "master" or "father," and is used in polite interrogation, much as we say "Sir?")

"You are surely a chief's son," repeated Knobel.

"No, I am not," said the youth. "But why do you ask?"

"Because you are so useless," was Knobel's reply. It is no compliment in this country to say, "You talk like a chief,"

for this implies that you may utter the most arrant nonsense without fear of check or contradiction. The youth promptly was dubbed "Useless" for the remainder of the trip.

In the stern, wielding the steering paddle, was a very fine type of boy named Makumba. He said he was a Mombadi from Portuguese West Africa and had come as a boy to Matseoakhumo's kraal with his father. Makumba kept the rest of the boys in good humor, and initiated many a spurt when haste was needed. In front of him paddled another Mambukushu native, also a cheery and good-natured soul. He was short but well built, and decidedly darker in color, though his features were not negroid, and he was decidedly hairy on the legs. Alongside him paddled another Mambukushu very similar to Useless in appearance, while a tall, sparsely built native, whose head was shaved except for a single strip about one inch wide on the top of his head, made up the seventh member of the crew.

In the meantime we were making steady progress up stream. At times the channel contracted to a span and the boat had to be laboriously pushed through a scarcely yielding barrier of reeds; at others, the water-way was clear except for pads of water lilies of all colors, pink, blue, white, yellow and purple, now opening to the sun. The valley widened until, against the yellow foreground of sun-bleached grass, the low edge of the forest lost its early morning clear-cut outlines and wavered hazy and indistinct in the heated air.

Life still gathered itself about the river. Here we would see an otter, its sleek black skin glistening as it dived and reappeared in a little bay in the reeds; there a fish eagle, white breasted and with a rich chestnut-colored back, eyed us arrogantly from a half grounded log, or a crocodile slipped noise-

lessly from a low bank into the water. Of herons, coots, ibis, avocets, geese we could keep no count.

Fertile and well stocked with game as the valley was, it bore singularly few signs of human occupancy. It was too open and inviting a prospect to be safe. Through here the conquering hordes of the Makalolo or Mantatees had swept in the earlier half of the nineteenth century to found a rather brief kingdom on the banks of the Chobe and the Zambezi rivers. They had set out from their home near Basutoland seven hundred miles away and had fought their way north through all the intervening Bechuana tribes. In 1864 every male Makololo was massacred by an uprising of the Barotse, whom they had previously subjugated. After them came the Batawana and at intervals the whole country was subject to periodic raids from the bloodthirsty Matabele.

In this part of Africa green pastures and still waters were not the abodes of peace. These constant raids left in the minds of the Ngamiland people a decided agoraphobia—a fear of open spaces. After these many years of the *pax Britannica* the Okovango tribes are beginning to creep from the shelter of the woods and swamps; but old habits are not easily broken and these people still have a tendency to conceal the thatch of their roofs among the reed beds, or to establish their villages half in, half out of the forest.

Close by one of these villages we came across an incident that illustrated the dependence of these natives on their own cultural set, and their inability to change. It showed clearly enough that the Bantu are really not people of the wilderness like the hunting peoples. As we passed near one bank we saw a native busily engaged in loading into his canoe the carcase of a beast that lay partly in the water. The animal's viscera had long since been devoured by jackals but the barrel of its body was still partly covered with flesh so

putrid that it tainted the air for a hundred yards around. Knobel explained that the man was not merely taking the body away to purify the water but was taking it home to his family to eat.

"In this country," he said, "all the cattle belong to the chief and the only chance that poor people have to taste meat is when something like this happens. A common farewell wish in the Kalahari is, 'May you find something dead on your way home.'"

This man had found something very much dead, and evidently accounted himself lucky. It seemed strange to us, however, that with all this abundance of wild life, a native should be reduced to such fare.

After our desert travel this inland voyage provided a strikingly different experience. There were so many new things that observation seemed blunted and confused. Among so many novelties, nameless to us, the eye ranged carelessly. It was almost with a sense of relief that the familiar presented itself—a bird of the kingfisher family, of most brilliant coloring, that is known in Australia as the bee-eater, and three Lehututu, birds the size of turkeys with red legs and beaks which we had met with in the Southern Kalahari. These were among the few that we could recognize and call by name.

A most umbrageous clump of trees standing in the middle of the river plain invited a brief halt, as there was still no sign of Matseoakhumo. This spot was evidently a favorite camping ground for hunters, for lying in the shade was the hide of a hippopotamus cut into strips. The trail of a large snake at the base of an ant hill made us look carefully round lest it betoken the presence of that most vicious and deadly of African snakes, the black mamba.

At the junction of the Santantadibe and the Gomoti, the

two streams that fill the Thamalakane, we found Sakoi, but no sign of the headman; so after waiting a couple of hours we decided to leave one of our Masubeia paddlers with one makora and press on, trusting that Matseoakhumo would overtake us at our next camping spot.

The reader will perhaps bear with some further description of our journey into the Okovango region, not written as a tale of adventure, for of that we had singularly little, but as giving a closer view of the Ngamiland native and of the nature of his environment.

CHAPTER XI

COVERT OF THE REEDS—THE OKOVANGO MARSHES

THE little Santantadibe stream, only twenty yards wide, seemed an insignificant gateway to the mysterious Okovango, but Madomo insisted that this and not the much larger Gomoti River was our proper route, and so we pushed on.

The narrowness of the stream lent itself to the construction of fish traps, evidently the work of Makubas whose village was close by. These traps consisted of a fence of split reeds across the stream, with at one place a narrow opening leading into the trap itself built in the form of a winding maze, out of which the fish evidently have difficulty in finding their way. At nightfall we were fairly within the swamp and camped on a heavily timbered island, a favorite haunt, so we were told, of leopards.

In the morning I waited for the headman while my companions went on ahead to shoot lechwe, a very graceful antelope of a light fawn color, which makes its home in the swamps. They are usually seen in herds, and make their way across the channels by a series of bounds rather than by swimming. The noise made by a hundred lechwe fording a stream is like the roar of a cataract. Lions stalk them in the reeds or hunt in couples, the male lying in wait while the lioness encircles the herd and drives them towards his hiding place.

At ten o'clock there was still no sign of Matseoakhumo so

I broke camp and followed the hunters. Soon we came to a couple of ledebas, small lakes in the swamp formed, so the natives say, by herds of hippos wallowing and trampling down the reeds. After the narrowly constricted channel, with views limited to the next turn in the stream, the eye ranged gratefully over this wider expanse, lightly shaded as it was by a very thin growth of reeds and stippled by the points of a thousand water-lily buds. On the further side of the lagoon was a feathery fringe of papyrus and above that the more solid tracery of the cottonwood palms, each with its fronded crown. On top of one of these mokolane palms an old baboon had found a perch and barked hoarsely in protest against our intrusion.

As far as I could see there was no break in the encircling reeds, but Madomo, avoiding the deeper water, made unerringly for a hidden channel and soon we were again hemmed in by the swampy growth. At intervals he would stoop down, grasp a handful of reeds and tie a knot in them as a mark to show Matseoakhumo the course we had taken.

Of the ensuing four days' passage of the swamps there is little worth recording. Each day we were told that the big river which we were approaching was still *kakala*, very far. By this time the minds of all of us, crew and passengers alike, moved only to the rhythm of the paddles, our attention narrowed to the bounds of a single interest, our passage through the reeds. It seemed as if we were sensitive only to the dip and thrust of the paddles, measuring each yard of gain.

This was indeed the covert of the reeds and whatever life it contained was securely hidden. In one place the rushes, beaten flat by the passage of heavy bodies, showed where the hippos had a runway from channel to channel; in another the reeds were trampled and the water still muddied

from the passage of a herd of buffalo, but for the most part the papyrus stood thick and tall and behind its screen a hundred eyes could watch us, themselves unseen. Even the birds were no longer in evidence; except for the evening flights of doves that shattered the peace of evening with their noisy family reunions, very few were to be seen. Once or twice, a honey guide, a bird about the size of a thrush, flew ahead of us with its characteristic dipping flight, uttering the whistling note with which it takes the hunter to the bee-hive. Finding, however, that we could not be lured away from the stream, it gave up in despair and flew back across the marsh. The boys told us that sometimes the honey guide is in league with the beasts of prey and will lure the hunter to the spot where the lions are hiding.

So the hours passed from early dawn when we rolled out of our blankets on some palm crowned island, ate our rusks and drank our coffee, till five-thirty at night when it was time to seek a camping spot and cook our daily meal. Apparently all our crew's efforts brought us no results except a view of another turn in the stream, another reed bed as thickset as before. The reeds, the brown water, the wooded islands, slipped gradually by but we ourselves seemed to stand still. The desert was not more timeless in its nature than these unending swamps that seemed to have swallowed us up.

On the fifth evening Knobel called Madomo from the men's fire. "Tomorrow," he said in Sechuana, "we shall have been six days on this river. In Maun they told us we should reach Mathibe's island in three days, but we are not yet there. Do not put us off with lies. When shall we reach this place?"

"I am an old man," answered Madomo, "why should I tell lies? The young may lie for they have not yet made them-

selves known for what they are, but for a man whose life is all behind him, why should he lie? What does the white man want to know?"

"Shall we reach the island tomorrow?"

"Ra," replied the old Makuba, "the island is still far. If we start at dawn and paddle all day then about the next day we should cross the big river and reach the island at night."

"Why have we taken so long?" was Knobel's next question.

"There is a short way, but this river is deep and full of angry hippos. If any harm came to the white men I should be blamed."

"We are not afraid of hippos," said Knobel. "They could not upset our boat."

"That may be true," the old Makuba said earnestly. "But the old boat is rotten. If it should be struck from below the blow would open all its seams and it would sink. You have seen how it leaks already. Then we should be left with one makora, and how could all of us get out with that?"

The old man was right, and so we decided to spend another two days in going up stream in the attempt to reach the "big river," the Ngoga; but then we must turn and hurry back so that I could spend more time on the journey between Maun and Livingstone, where I was assured I could see Bushmen. We had met two Bushmen on their way down stream and from them our boys had learned that some epidemic had visited the Bushman village at Tsubaora, for which we were headed, and that the survivors were scattered through the swamps. We had also seen the reed framework of some Bushman huts on a little knoll, but the place was deserted.

Next day the water deepened and the country was more

open and interesting. According to Stigand's map, the stream we were now on was the Boroga, Mboroga or Borota. The traveller, as is so often the case with these native names, may have his choice of spellings and pronunciations.

Soon we were passing through our second tsetse fly belt. This fly is a little smaller than a bee and has a painful sting. They are not supposed to fly out over an open stream but these Okovango tsetse did not obey the rules. This fly was probably *Glossina morsitans* which carries the cattle disease but not the sleeping sickness. However, it may have been another species which carries the *Trypanosoma rhodesiense*, from which comes the dreaded sleeping sickness of southeast Africa. Fortunately for us the insects preferred the dark skins of our paddlers and settled but rarely on ourselves. They provided us with the occupation of knocking them off the backs and legs of our paddlers, who did not seem to mind their stings.

Stimulated by the promise of another shilling, the boys were poling and paddling with a will. I noticed, however, that Hyena Cap, as we called the man in the bow, did not participate in any of the spurts which Kakumba initiated, so at last I leaned forward and touched him, calling "Urree, Urree!" the words with which the paddlers stimulated each other. Then the man turned round and showed me his hands. On every finger of each hand was at least one blister, the lifted skin showing yellowish white against the raw red flesh beneath. It may have been true, as the boys insisted, that Hyena Cap's blisters were the result of a previous trip, but if he began this long grind with sore hands so much the worse. And for this I was paying a shilling a day and two pounds of mealies! Whether we were to reach Tsubaora or not, there would be no further calls for speed from me.

Though our passage through the swamp was monotonous,

it must not be supposed that game was not abundant. Away from the stream on either hand were timbered rises that would be islands in the big floods but were now hillocks separated by dry reedy flats, an ideal place for game. On this sixth day, having paddled six hours from our overnight camp, we decided to land for lunch and do some hunting. We had finished all our provisions, and mealies, boiled overnight by Kakumba, were not very appetizing, so that fresh meat would be acceptable. There was an abundance of spoor, lechwe, tsessebe, impala, lion and among them the great splayed hoof marks of the buffalo. Though Madomo declared that these tracks had been made the night before, this proximity to big game excited our interest.

We had scarcely broken through the timber that lined the bank when we came upon a large herd of lechwe and impala. With Madomo and his companion well ahead we followed the blood spoor of a wounded lechwe. Just as I had determined that we must go back to the boat, we saw Madomo beckoning to us in great excitement. Everyone at once ran forward, and pointing to fresh spoor, Madomo whispered "Ngare! Ngare!" (buffalo), and at once set out at a dog trot following the trail. I soon grew tired of running and fell behind, realizing that the light rifle I carried would be of no use in shooting buffalo.

Suddenly there was a great commotion in a belt of mopane trees about sixty yards ahead of me. Natives were running in all directions or trying to climb trees. The doctor had already swung himself into the branches and Knobel, handicapped by a shotgun without a sling and also by considerable "middle-age spread," was attempting none too successfully to do likewise. Then Sakoi burst out of the timber. He seemed to have lost the power of speech for he would run twenty yards then turn and point excitedly and

run on again. He passed me like a shot, beckoning me also to run for an ant hill, whose top reached most conveniently into the lower branches of a stout tree. Just as I turned to run I saw the black backs of two buffalo bulls as they charged side by side in my direction. Though Sakoi had twenty yards start, I was close on his heels by the time he reached the ant hill. Then I found that the buffalo had not really seen us but had charged as soon as they got our wind, and were now angling off, passing about thirty yards to the right of Knobel. It was then that Madomo, the only man who had stood his ground, rushed up to Knobel crying, "For days you have been asking me 'Where are the buffalo?' Well, there they are—why don't you shoot them?"

When Knobel showed him the shotgun he was carrying, Madomo shook his head sadly. "That is a gun for a boy to shoot birds with," he said, "but not to bring to this place." After this experience, Knobel was quite ready to admit that the old fellow's reproof was just.

Wherever big game hunters foregather in Africa, there are great discussions as to whether the lion or the buffalo should be considered the more dangerous. Selous, who shot both in large numbers, was inclined to put both the lion and the elephant before the buffalo, but having regard to the impossibility of stopping a charging bull, he finally decided that the buffalo was more to be feared than the elephant. Having shot over two hundred buffalo without mishap, it may be that he underestimated the risks, although his first adventure with one of these animals cost him the life of his horse and very nearly his own. The bull disembowelled the horse, throwing Selous to the ground, and then charged the man, striking him a severe glancing blow with his horn.

Livingstone, though he had had his shoulder mauled by a lion, thought the buffalo more dangerous. "More accidents,"

he says, "happen by the buffalo and the black rhinoceros than by the lion." Andersson, who escaped a furious rhino by crawling between its hind legs, thought the lion to be the most dangerous animal in Africa "with the exception of the buffalo."

Millais, the biographer of Selous, disagrees with his hero on this subject. He quotes Judd, a very noted hunter, who said, "As for buffalo, I consider them far and away the most dangerous game." He speaks of their ability to force themselves through the densest thickets and of their habit, also described by Livingstone, of lying in wait for the hunter when wounded.

As regards their tendency to make unprovoked charges, we had ample first hand evidence. It seems that on Madomo's previous visit to this region buffalo charged right through his camp at the exact spot where he had slept the night before. His nephew had just time to throw himself into a thorn bush, the buffalo barely missing him with its horns and breaking the stock of his gun by trampling on it. Madomo spent the most of the next morning picking thorns out of his nephew's hide. All this disposed us to agree with Finaughty, a noted elephant hunter, when he said, "Far better follow up a wounded lion than a wounded buffalo, for the latter is the fiercest and most cunning animal to be found in Africa."

That evening as I wandered about our camping spot trying to shoot some doves for breakfast, I kept a wary eye on every thicket of brush, for buffalo sign was everywhere. There were many lion tracks also but except for some roaring in the distance about dawn we were not disturbed by them in any way.

That lions can also be dangerous was brought to our minds when we passed a spot which had been the scene of a

tragedy a short while before. Three men, Hyde, Gray and a Dr. Gerber, had gone for a hunting expedition into the swamps. Hyde wounded a lion and with Gray following him went into some long grass where the animal had retreated. As he neared an ant hill the lion sprang out from behind the hill and seized him. Gray rushed up, broke the stock of his rifle over the lion's head and then tried to drag it from off Hyde's body by seizing it by the tail. Just as the beast turned on him one of the natives ran up and shot it dead.

They loaded Hyde into a makora but shortly after reaching Maun he died. For three weeks, Gray, though without a scratch, could neither speak nor think of anything but his terrifying experience. His condition grew worse and his father flew up from Mafeking. His arrival seemed to steady the young man who was then declared out of danger. A few hours after the father began his return flight, Gray died.

On the next day of our journey, when it seemed impossible to reach Tsubaoro before night, I determined to turn back. After all it was merely a name on Stigand's sketch map and represented no great peak of accomplishment even if we reached it. It was now plain that without Matseoakhumo it would be an almost impossible task to find the Bushmen, but I had at least been able to judge for myself the nature of the environment and the extent of its food resources. Of game there was the greatest profusion. Almost every island in the swamp had its herd of antelope. We could see in the smaller streams the tracks of numerous hippos. When the brown vegetable matter at the bottom of the shallow streams was disturbed, the white sand beneath showed clearly the huge footprints. Had we been a hunting party we could have shot rhino as well, but such slaughter would have been entirely unjustifiable as we could not have used the meat.

That evening as we paddled down stream on our way back, we rounded a turn in the river and came upon Matseoakhumo seated in a makora with a couple of paddlers and accompanied by his chief henchman, a little man in a battered straw hat. The headman had evidently exhausted all his energy in finding our crew of paddlers and when friends arrived at his kraal he promptly forgot all about his appointment with us at the Santantadibe. Next day he had ridden on horseback as far into the swamps as he could but failed to catch up to us. At the junction he had found our messenger and had followed us into the swamps, reading the signs that Madomo had left for his guidance.

With the arrival of the headman, Madomo no longer had the responsibility for the party and the boys in our boat signaled the occasion by doing their best to come up behind him unawares and ram his makora with our boat. The efforts of the old man and his companion to escape when he realized their intention caused a great deal of laughter and we went racing down stream at a great rate. That night there were courtesy gifts passing between Matseoakhumo's campfire and our own. He presented us with a plate of roasted peanuts and a bowl of porridge and sour milk, which Knobel enjoyed but I would have none of. On our side we gave him tea and cigarettes and, for his good will but not for his efforts, the blanket we had bought for him in Maun.

The next day was memorable for a buffalo hunt. As our party had grown in number to sixteen men, fresh meat was an urgent consideration, so Madomo was instructed to keep a sharp lookout for game, such as giraffe or buffalo. Just when we were passing through a populous belt of tsetse fly, he suddenly signalled us to land. At this spot the grove of mokuchon trees that fringed the water was specially fine and dark with shade and beyond that the blazing sunshine

seemed to stand like a wall through which we saw the wavering colors of the marsh beyond.

Then from behind a tongue of dark brush that jutted into the yellow of the reeds came three buffalo bulls looking black and enormous against the garish sunlit background. They walked slowly across our front and were followed by five more, also bulls, three of which stopped and with contented grunts lay down. The boys distributed themselves near convenient trees, while the white hunters with Matseoakhumo and Sakoi stole forward. A movement in the brush to our right showed that these bulls were probably only the advance guard of the herd. I had just started to run forward to warn my companions that we might be caught between the animals in front and those at the side when I heard the crack of the doctor's rifle.

With the sound the lazy quiet of the African scene resolved itself into a dozen mad vortices of rush and confusion. There were all at once natives running and climbing trees, buffalo snorting with rage or terror, dark bodies hurtling through the dust eddies, and punctuating the whole the staccato reports of the rifles. The last I saw of the game were the three bulls going at full gallop across the flat sixty yards in front of us, the last one appearing to labor somewhat behind the rest.

The firing ceased and we stood looking at one another in open mouthed disappointment. But before any one could speak, a deep lowing sound came from the direction in which the buffalo had disappeared. Madomo gave a yell which set us all off running across the flat. This deep bellow is the sign that a bull is mortally wounded.

Soon we saw an animal alternately struggling to its feet and falling over again. Another shot settled it and as we stood looking at the beast, a call from one of the boys drew

our startled attention. Hidden in the grass, not fifty yards away, was another bull, fortunately dead. Had it been merely wounded and lying in wait we should have been nicely trapped in the open. This buffalo had a bullet through it which had touched the heart and yet it had run almost half a mile.

Returning to the river I found another makora had arrived manned by two Makubas, Kahu and Tembwe by name, magnificent specimens of manhood, both over six feet two. These were regular river men and very different to our scratch crew. As Kahu pushed through the reeds, his quick eye caught a slow movement just where a shaft of sunlight struck on a yellow and brown reticulated back. A few whacks with a pole and he dragged out the still writhing body of a young ten foot python.

That night while the buffalo steaks were frying, we talked over the situation and I decided to take our makora with Kahu and Tembwe and return to Maun ahead of the rest, bringing the truck up to the Santantadibe junction. There we would leave the boat to be taken to Maun under Sakoi's charge, while we with Matseoakhumo and Kakumba made for the Mababe Flats where the headman said there were Bushmen.

The stars were still shining and I could hear the hoarse barks of baboons and the coughing grunts of a lion as I ate my breakfast in the morning. Fearing that buffalo bull would be a bit tough, I had shot a couple of doves but on cooking them the night before, Useless had evidently dropped them in the sand, so that I had a very gritty meal. Just as it grew light I went down to the river and found the Makubas waiting.

Wreaths of mist hung low upon the surface of the stream, until the sun, touching the tops of the reeds, dispersed them.

From where I was seated on the bottom of the makora the reeds appeared like the ranks of an army, on one side tossing plumes and pennons, on the other the green blades of the rushes like a thousand swords held at salute. Aided by the current and the powerful thrust of the poles we shot round the turns at considerable speed, surprising not only a couple of otters hunting their breakfast, but what was quite unusual in the winter season, a crocodile in shallow water. A bullet from my pistol made him depart in a flurry, drawing delighted chuckles from my crew.

At noon we reached the Thamalakane, having come down in half a day a distance it had taken us two days to go up. In the early afternoon a strong breeze sprang up behind us and when the water was clear of reeds I took one of the men's assegais and hoisted my camp sheet on the handle as a sail.

This mode of progression was entirely new to the Makubas and they could not understand why, as we slipped through the water, their poles did not meet with the same resistance as before. Consequently, the harder the wind blew, the faster they paddled and poled, until the makora fairly flew. Such a performance made history on the Thamalakane, for the inhabitants of a kraal near the stream had never seen such a thing on the river, and lined the banks, petrified with amazement. The conversion of a dugout canoe into a sailing vessel was perhaps a risky experiment, considering the crocodiles, but it was great fun.

Where the reeds closed in I dropped the sail and we proceeded much more soberly. Here occurred an incident that gave me some insight into the Makuba sense of humor. At one spot the channel swung close to where a beast had come down to drink. It looked like the original cow with the crumpled horn, so crumpled in fact that it grew straight

down the creature's face to its nose, whereas the other grew out in normal fashion. The appearance of the cow was certainly ludicrous but I was hardly prepared for the gales of laughter with which Kahu and Tembwe hailed the sight. For a time I feared the makora might be upset by their mirthful contortions.

My seat in the bottom of the canoe, after ten hours of travel, was by no means comfortable and to ease my cramped muscles I shifted back a little. To my surprise I found a soft spot into which my anatomy fitted most comfortably. A little later, as I was enjoying this unlooked for ease, it seemed to me that I could detect a slight movement underneath me. For a time I was too comfortable to investigate but another slight stir caused me to lift up my blanket and peep below. Then I found that I was seated in a hollow made up of ten feet of curled up python, apparently incapacitated but by no means wholly dead. My boatmen it seemed were taking it to their family, and the fact that it still had a wriggle in it meant merely that it would arrive at their village all the fresher than if it were killed outright. Unfortunately, I had too much imagination to enjoy sitting on a snake with even a small degree of muscular contractility left in its system, and I changed my position. No doubt the people in Kahu's village would enjoy spare ribs of python for many meals to come.

Thanks to the remarkable progress we had made by combining sail and paddle, we arrived at Maun before nightfall, having completed our sixty mile trip in twelve hours. Next day, having said goodbye to our friends and reloaded the truck, I returned to the junction, arriving just after the main party and in time to see an incident that illustrated well the shrewdness of native character.

Knobel had taken the boat up the river to try to get a

shot at a crocodile that was said to watch the ford very closely in the hope of getting an unwary traveller who was too impatient to await a chance to be ferried across, if the makoras were all on the other side. As Knobel passed along the river he saw a little girl of about eleven years of age watching some cattle from an ant hill. Knowing that this work is usually left to boys, he stopped to enquire the reason. It seemed that her brothers were small and she had assumed charge of the cattle. Having answered him politely, she enquired what he was doing, and said that she would watch the river while he went on in case the crocodile appeared in his absence. Knobel was so struck with her independence and frank friendliness that he said he would send her back a present.

When he returned to the junction he sought out some native jewelry that he had brought with him and then called Useless.

"Do you see that ant hill?" he asked. "Take these ear-rings and give them to the girl that you will find watching the cattle there."

Useless looked doubtfully in the direction indicated. "Oh, that is *kakala* (far)," he objected.

Knobel had hard work to restrain his anger, for the Dutch though kind to the natives are prompt to resent any disobedience or disrespect on their part. Instead of meting out immediate punishment, he called the old Makuba to him.

"Madomo," he asked sternly, "are these young men your children?"

"Ay, *More*," answered the old man, acknowledging not paternity but his responsibility for the younger group.

"Just now," went on Knobel, "I asked this boy to take these ear-rings to that ant hill yonder, and he had the impudence to tell me that it was *kakala*. We in the Southern

Kalahari know what to do when a young man answers an old man thus. What do the old men here do in such a case?"

The old Makuba spread his palms in deprecation but there was a glint of humor in his eye.

"Ra," he said, "these are bad days, and you see for yourself how the young behave. But before the white men came no young man would dare to speak to his elders thus. When it came to his turn to go to the Bogwera these things would be remembered and the vultures, the ants and the bees would punish him. If he still did not learn he would be stung to death. But the white man's law has changed all that."

The Bogwera, it should be explained, is the name given to the circumcision school to which formerly all Bechuana youths were sent in groups for six weeks or more at a time. The "vultures" were the men who punished the boys for their remembered faults of disobedience or disrespect, and the "ants" and "bees" were the sharpened sticks and thorns with which the initiates were beaten. The actual circumcision was only one part of the rites and constituted, of course, the physical sign of initiation.

"Well, then," continued Knobel, "what do the old men do now?"

"You have had this boy in your boat for nine days," was the shrewd reply. "You have seen how he behaves. What have you done about it? There he is—teach him the white man's way."

But by this time the turn of the conversation was by no means to Useless's liking. He waited to hear no more, but snatching the ear-rings from Knobel's hand he actually ran to deliver them.

Knobel's attitude towards Madomo was typical of that of the finest kind of Dutch South African. The two men had achieved a considerable respect for each other so that Ma-

domo, though never presumptuous, felt no restraint in expressing himself. So long as natives made no bid for equality nor appeared to encroach by a too evident self-assurance, Knobel was both considerate and generous in his treatment of them, even to the point of seeming indulgence. As we parted from the group after paying them off, I noticed how Madomo held our friend's hand in both his own and then very gently stroked the white man's forearm when saying farewell. We had been in the closest contact possible with our boys during the nine days of our journey and with the exception of Useless, they had gained our respect and liking. Kakumba I was specially taken with, and was glad that he was to act as our camp boy as well as attendant on Matseoakhumo in our trip to the Mababe.

CHAPTER XII

HUNTERS' ROAD—MABABE

AFTER reloading our truck we set off in the early afternoon for Mababe, which lies about one hundred miles from Maun. This place has run through the usual stages of Kalahari desiccation, having been first a lake, then a swamp or reed bed and is now a huge dry flat surrounded by thorn bush and mopane forest. It has always been famous for its abundance of game, being one of the favorite hunting grounds of Selous, who shot many elephants here. Here, too, lived some wandering groups of Masarwa belonging to the division known as Hiechware, who were nominally subject to the Masubeia, who in turn owed allegiance to Matseoakhumo: with the latter accompanying us we would have little difficulty in getting in touch with the Bushmen. We expected to be able to hold them at our camp by supplying them with fresh meat, for the Mababe Flats are still grazed over by all kinds of game, including zebras and giraffes, while the surrounding forests are the haunts of numerous lions, elephants and an occasional rhinoceros. Up to the last year or two His Majesty's mails from Livingstone to Maun were carried by native runners, convoyed by askaris or native police with rifles. It was no uncommon occurrence for the whole party, carriers and convoy alike, to be driven to take refuge from lions in trees, thus delaying the mails. Usually it was a ten days' journey.

We travelled for a time through mopane forest and then ran for some distance beside the dry river bed of the Mok-

hokelo, which the headman informed us had flowed in Captain Stigand's time. Now its shallow valley, or vlei, was the chosen feeding ground for all kinds of game which ventured out into it from the fringing forest: graceful impala, sleek skinned and with long curled horns, sprang six feet in air as they bounded across the track; shaggy wildebeeste whirled in a cloud of dust when they saw us approaching; roan and sable antelope, aristocrats of their kind, stood and looked at us before they bolted for the mopane; tsessebe, ugly, goose-rumped, high shouldered and ewe-necked, trotted off to shelter, while kudu, eland, steenbok and duiker were also plentiful. We passed flocks of hundreds of guinea fowl, and just missed running over scores of broods of Kalahari pheasants. Standing in the high grass we saw several of the giant bustards or pauw, while in flight along the edge of the timber were hornbills, blue jays, Go-away birds and many others.

It was also good lion country and seated by the campfire that night Matseoakhumo told us how, just a year before, a Masubeia woman, emptying ashes outside her hut in the evening, had been seized and carried off by a lion. The next day he and a party of natives had tracked it down and shot it. We had halted rather late to make camp and as we scattered through the brush to gather firewood I found myself flashing my electric torch here and there and looking over my shoulder in case I should see a tawny shape slinking through the cover.

We reached the Flats about the middle of the following day and attempted to drive across the veldt to the Masubeia village, which we could see about a half-mile distant. This might have occasioned a real mishap, for one of Sally's front wheels broke through into a deep ant-bear hole, from which, however, we were lucky to extricate ourselves without a broken axle.

The village consisted of half a dozen huts each with its seven foot palisade of thick river reeds and sharpened poles. The entrance of one was closed with a woven mat of rushes and from behind this screen a girl peered at us. She was being rigidly secluded as part of the puberty rites, but the arrival of white men was too much for her curiosity. A menstruating girl must not look at a man or evil will befall him. Apparently it did not matter about white men, so she discreetly covered up with one hand the eye that was towards the natives and looked at us with the other.

These Masubeia belong to one of the tribes that are subject to the Batawana and they and their village impressed us with all the force of a recent contrast in experience. We had come from a wilderness of swamps and running streams to a place where water was again precious and must be used in spoonfuls or else the people suffered. We walked across the poor gardens of these folk to their well, the sole source of supply for the inhabitants of the stadt, on which, if we remained several days, we should have to depend.

It was an eighteen foot hole, dug in the dry bed of a small creek—a winding depression on the veldt. There was of course neither bucket nor windlass. The means of descent consisted of a crazy ladder made of two crooked poles with cross pieces lashed on at irregular intervals by means of leather thongs. Down this rickety contraption I clambered for twelve feet and then lowered myself the remaining six feet by straddling thin poles stuck crosswise in the sides of the well. At the bottom in a chamber rounded and smoothed by constant scraping, were a couple of gallons of muddy water. The dirt and sand dislodged by my clumsy descent had not improved its quality, but even after it had settled I do not think I have ever tasted water of such an earthy or musty flavor.

Between the stadt and the well straggled the native garden—a few melons and gourds and some thin stalks of native tobacco. These and the half-dozen ragged huts represented the full sum of human endeavor in this region. Little indeed have these people to enter on the credit side of living. Over and above the pains and toils of subsistence there cannot be much to carry forward towards even a meagre surplus of enjoyment. It seemed to me that this little village was but a poor monument to man's centuries of struggle against the wilderness, a rather discouraging symbol of his hopes and purposes. Can a man express his strength and self-assurance in walls of reeds, weave the fibre of his endurance into mats of grass or hammer his confidence into these soft untempered spearheads of native ore?

It would seem at first sight that this clinging to the first rung of civilization was entirely profitless; that it would be easier for these people to wander footloose with the Masarwa, heedless of providence and feeling no responsibility beyond the satisfaction of the needs of the present. The effort of generations, without apparent accumulated gain, has merely served to establish this poor residence in a remote and lonely spot where nightly, so the Masubeia told us, the lions roar around the kraal. But under similar primitive conditions, man has again and again dug himself in, defying droughts and floods, poverty and starvation to dislodge him, grimly hanging on. After all, these palisades of reeds, this straggling, ill-kempt garden, these crumbling mud walls perhaps deserved our respect, as evidence of the toughness of Masubeia fibre. From such roots did civilization spring. Out of this ability to hold what has been gained, no matter how pitiable its sum, have come planning, order, prevision, the consolidation of society.

For us the immediate problem was not to philosophize but

to consider how we should eke out these slender resources and apply them to our use. We needed water and Bushmen. Of the first, we had about two gallons left and it was not at all certain that the meagre supply at the well would be sufficient for ourselves and the Masubeia also. Once emptied, so the natives said, the little cavity took all night to fill. There were no tsama melons in this part of the Kalahari to supplement the supply. Would we be justified in asking the Masubeia to share with us this slender store? Yet it might take some time for us to find our Bushmen and, once found, a couple of days for me to test and measure them.

Our doubts, however, were soon resolved, for scarcely had we returned to camp when four girls appeared winding their way across the veldt. Three of them bore gourds of water and the fourth an old enamel mug, all carried on their heads. As I did not care to mix the water from the well with the river water, I kept two of the larger calabashes. In a little while two very voluble and excited women appeared from the stadt, and quickly retrieved their household utensils. They were willing enough to share their precious water with us—and that unasked—but to allow their gourds to remain in our possession even temporarily was expecting far too much. Apparently the extreme poverty of these people gives their few possessions an exaggerated value in their eyes. I had noticed several empty gourds near the well so there could be no shortage of these containers.

As for the Bushmen, Matseoakhumo picked out a youth from the stadt and gave him orders to find the Masarwa and send them to our camp. As a badge of authority he lent him his rifle and two cartridges with strict instructions not to fire the rifle unless lions attacked. The Bushmen would have to travel all night to reach our camp, and some protection might be necessary. I do not know what kind of shot the

Masubeia was, or whether he could shoot at all, but the possession of a gun would give the Bushmen a rather unfounded assurance of safety.

Next morning, just at dawn, six Bushmen filed into camp and seated themselves at our fire. They were of a somewhat different type to the southern Masarwa, being darker in color, a little taller, and possessing tufty rather than peppercorn hair. They were of the same slender bodily build as the Bakalaghadi, with, however, in some cases a tendency to steatopygia. There was no doubt of their Bushman blood, though it is quite possible that it was mixed with that of other peoples, probably the Masubeia.

As soon as the Masarwa arrived Matseoakhumo rolled out from his skin kaross and talked to them. He had been Stigand's guide on his Ngoga trip and the explorer has remarked upon his reputation as a humorist. He soon had the Bushmen laughing, probably with his description of our party and its queer purpose.

Luckily they had not encountered lions, though just as they came into camp we heard roaring, but at some distance across the veldt. That we had not heard them close by was of no particular assurance, for Selous had stated that on every occasion when his camp had been entered by lions they worked silently. It was on these same Mababe Flats that he found lions most numerous and had some of his most exciting adventures. From the Masubeias' account of their nightly visitations we had expected to hear them round the camp, especially as we had fresh meat there. The Bushmen explained their absence by saying that the lions must have heard that some angry white men were coming and had moved away.

While I carried on my work my companions went hunting with a Bushman as guide. One day he promised to take

them where game was plentiful but after a long drive across the veldt where they saw nothing but tsessebe, they discovered that he was interested only in eland, the fat of which they prize very much. The trouble was that he led them over very rough ground with the result that one tire was punctured badly and the engine boiled. Our precious water was now reduced to half a gallon.

While testing the Bushmen without an interpreter, my communication with them was by what Professor Doke has called "signs and wonders," but we got on very well. I had no reason to complain of their lack of interest in the proceedings. One of the tests I used consisted of a series of printed mazes of increasing complexity, through which the subject must thread his way without getting trapped in blind alleys. The Bushmen having worked through these during the day, were watching me as I was throwing a number of used test blanks in the fire when a current of air blew a paper within reach of one's hand. He at once seized a charred stick from the fire and lying on his stomach, with the rest as onlookers, began again to work through the maze. Seeing their evident interest I gave each man a test blank and in a moment there were six Bushmen with their heads to the fire and their bodies radiating out like the spokes of a wheel, all most intent on their self-appointed tasks. As each man finished he changed with his neighbor until they had all worked through the set.

There was, however, one old man who had been left behind to guard the women at their village but whose curiosity had driven him to follow the rest to our camp. He had such defective vision that I had not given him the test during the day. Now he sat on one side, apparently taking no interest at all in what the rest were doing. His display of unconcern was so obvious that I wondered whether it might be only

pretence. To test the matter I offered him one of the simpler designs. In a trice, he had pushed one of the younger men aside and was down on his belly with the rest, working away as eagerly as any of them. When he had finished he came to Knobel with a complaint.

"I am not a child," he said. "The teacher [as the Masarwa called me] has given me too simple a writing paper."

When all the tests had been worked through, the spokesman for the group came to me. Would the teacher allow them to take these papers back to their camp? They would like to show their women how clever they were.

A more delightfully human reaction it would be hard to imagine. With pleased grins on their faces each one carefully folded his paper and dropped it into a narrow-necked woven basket which one of them carried. This man then produced a very old but cherished hut receipt for twenty-eight shillings. How he could possibly have raised the money I know not, and in any case, the Bushmen are exempt from hut tax. Probably it had been given to him by someone else, although Colonel Rey records that a Bushman once insisted on paying such a tax. He said that the Bakalaghadi treated him as a dog but now he possessed a paper which would prove he was a man and not a dog. Also he would pay no more tribute of skins to his masters, since now he was the government's man.

The following day I had an excellent opportunity to observe some primitive child behavior. A youth had appeared at the camp, accompanied by a little potbellied naked youngster of about five years. For six hours this child did not ask any attention from anyone but sat quietly playing with his toes in the dust. When the Bushmen cooked some meat and asked me for *metsi* (water), no one offered the little chap either food or drink. Presently one of the Masarwa

saw some vultures hovering over a spot on the veldt and sallied forth, returning with the remains of a tsessebe that had been killed by lions. The youth then began scraping some of the back sinews of this animal. At once the child got up and taking one end of the sinew in his little fists held it tightly so that his brother could scrape it more easily.

I offered him a drink of water and a sweet biscuit, both of which he took eagerly. When his brother loaded himself with meat to return to the village the little fellow found a stick and toddled off across the veldt bearing a couple of pounds of meat balanced at each end. His conduct made me wonder whether the child psychologists might not have something to learn from the Bushmen with regard to the development of independence, helpfulness, self-effacement and good humor in small children.

At Mababe we said goodbye to Matseoakhumo and Kakumba and journeyed on to Kachikau. We were lucky to find good water at Tsotsoroga Pan for just beyond it we ran through twelve miles of the worst sand we had yet encountered. As we drove through the mopane forest we came on a small fresh water pan, round which elephant tracks were numerous. We could see by the huge sliding footprints where they had whirled in alarm from the pool.

We had now left the Flats and the mopane forest behind us, and had come to more open country which is still one of the best big game haunts in Africa. Here a herd of elephants had stopped by the track to throw dust over themselves and a little further along a giraffe and her calf stared at us from a patch of scrub before cantering off. We were so close to them that we could see that the cow's shoulder had been freshly scored by the raking claws of a lion. In Selous' opinion, few of these ungainly animals are killed by lions mainly because, as he says, they are awkward to pull down. It takes

a tremendous spring for a lion to land on a giraffe's back and there is always a chance that the attacker may be kicked on the head or hurled to the ground by a glancing blow from the giraffe's shoulder.

Soon after we crossed the first eminences of any size that we had seen for weeks—the Gobha Hills—covered with trees, among which towered several fine baobabs. Beyond them we came on a cattle post which had been the scene of a tragedy three weeks before our visit. This stockade had been used by Englebrecht, a Dutchman, who drove cattle from Ngamiland to swim across the Zambezi at Kasungula, for distribution to the Northern Rhodesian markets.

Notwithstanding the stockade, lions, which are both bold and numerous hereabouts, had succeeded in stampeding the cattle and had killed a beast. Next morning Englebrecht had an attack of malaria and so gave his rifle and a couple of cartridges to two of his native boys who trailed and wounded a lion. The following day the cattle drover and his best hunter took up the trail. Coming up with the lion both of them fired and it fell apparently dead. Though this was Englebrecht's fiftieth lion he did a foolish thing—he walked towards it without reloading. The boy called to him to be careful but after stopping a minute, the white man walked on. Suddenly the lion sprang up and seized him. The boy had shot his last cartridge but nevertheless he ran up and catching the lion by the tail, dragged it away, still worrying its victim, so that he could get hold of the rifle which had fallen beneath his master's body. Then with incredible coolness he reached down, took two cartridges from Englebrecht's pocket, and shot the lion dead. We heard the story from Mrs. Englebrecht as we stopped at her place on our way to Livingstone. The Government has since given the native a medal for his bravery, but his most prized distinc-

tion is the "praise-name" which his people have conferred on him. It means "The man who pulled the lion by the tail."

At Kachikau opposite the Caprivi Strip on the Chobe or Linyanti River, we camped with a Greek trader—a great lion hunter who had shot thirty-nine in twenty months. My most comfortable bed in the Kalahari was in this camp and was made of lion skins piled high beneath me.

Here, with the help of the native corporal in charge of the police post, I was able to collect a group of fourteen Bushmen for study. These came from the neighborhood of the Shua and Nata rivers which rise near the Southern Rhodesian border and flow into the Great Makarikari Pan. They belonged to different groups, Hiechware—forest people—Madenassena, and Mathete, and were somewhat different from the true Masarwa. Several of them were very tall but all spoke the Bushman language and pursued the Bushman mode of life. While I worked in the day, my companions scouted the country for lions.

Were this a hunting tale I could tell of our nightly drives along the river in the hope of seeing lions in the headlights' glare; of how the doctor and a hippopotamus nearly scared the life out of each other when they met unexpectedly one evening in a native garden; or of how, while my companions sat in a blind forty yards from a lion kill, I had the thrill of seeing the lion sit on his haunches and look at us, then walk by not thirty yards from the truck as we waited some two hundred yards away. But these and many other incidents would make too lengthy digressions.

I must, however, reserve some space for the final happening of our trip, a circumstance that might illustrate for the reader the loneliness of life in this untamed territory. We were on our last hundred miles that were to end our journey at Livingstone. Our way was made interesting and some-

what difficult by the activities of baboons which had rolled stones on to the track from the slopes of the hills that border the Chobe River and by the roguishness of a herd of elephants. These had amused themselves by pushing down quite large trees over the track. We were anxious to catch a glimpse of them but were lucky to miss them, as we found later that they were real rogue elephants and had chased the police trooper half a mile along the road on the previous evening.

We came upon this same sergeant of police at his camp near Kasangula where he was busily engaged in making a boat from which to catch tiger fish in the Zambezi. Though glad to see us, he was not in very good temper. A few days before a brother officer had paid him a week-end visit but unfortunately the sergeant had business elsewhere. When he returned he found that his visitor had blown his brains out.

Our friend was laboring under a bitter sense of grievance. Why, he asked querulously, did this other man need to make a mess of *his* camp when he had one of his own to commit suicide in? Thus our exit from this region was marked by this queer note of tragedy. It made us wonder what sad tale of loneliness or frustration was behind it all, and whether missing the other man's company when he needed it most was the last straw of an already overwhelming burden.

This is indeed a hard land for either black men or white, who choose it for their habitation. It either toughens you or breaks you. Those who survive its loneliness, its aimless days and threatening nights must draw heavily on their reserves of courage—and sometimes the well runs dry. To be reasonably happy, a man's thoughts must either have the sweep of the universe, or else he must wall up his mind and refuse to think. For those to whom the merely beating pulse,

the intake and outgo of breath, the flux of sensations are enough, for those who are stripped of all desire and ambition save only the wish to remain alive, the wilderness may be a refuge. But for those who carry with them Pandora's box of expectation but find their youthful dreams of accomplishment gradually dropping away, life in the desert must seem continuous with the grave, having neither knowledge nor device, nor outcome of the morrow.

After all, the only people who really belong in the wilderness are the Bushmen. Thorns, empty pans, sand belts, dry plains or endless swamps, heat and loneliness, thirst and starvation, danger from wild beasts are what the Kalahari offers to those who make it their home. Yet planted in its midst are these little, slender, quick-eyed people, forever hiding and stalking, spying on the other things of the veldt, steeping themselves in its lore. Against animal cunning the hunter opposes ingenuity and stealth, against the terrors of the night the kindled blaze, against loneliness dancing and merriment. His hut is little more than a heap of sticks and grass, so flimsily erected that it can never stay his wanderings by being a home; his possessions a bow and arrows and a skin kaross, so light that they can never burden his shoulders. Magic-ridden, suspicious, irresponsible or indifferent as we found him, he is withal merry-hearted, without care for the morrow, belonging in the wilderness, unafraid.

I have already pointed to the contrast between him and the poverty stricken men of the kraals, those who have never succeeded in taming the desert but have merely temporized with it. There are their cattle posts and the herders' fires; there the sun-smitten patches that they call their fields; there stand the miserable grass-thatched dwellings, thorn enclosed; and there they must remain, condemned to the endless struggle of those who live between the desert and

the sown. Of them it is true, as Lawrence of Arabia wrote, "To be of the desert was a doom to wage unending battle with an enemy who was not of the world, nor life, nor anything, but hope itself." For the white man who occasionally comes here, and finds himself shut off from his kind, his misery having no company but his own thoughts, it is no wonder if the wilderness becomes at some time too much.

To go to the desert and return is a fine experience, but only the Bushman can remain there happily.

CHAPTER XIII

ENVIRONMENTAL COMPARISONS—AFRICA AND AUSTRALIA

IN the foregoing pages the object has been to present as intimate a view as possible of the Kalahari and its people. Through this narrative, unexciting as it may be, the reader may get a clearer and more animated view of this part of Africa than is possible by means of a more detailed geographical description.

To view a country hurriedly from a train window or even from a motor car travelling along its highways is to miss its essence. But to experience all the difficulties and anxieties that people native to the place meet with in their everyday journeying to and fro, to be yourself dependent upon what the land produces, to make your bed on its soil, and to measure, painfully and by your own effort, its distances—that is the way to get the feel of things, to learn as it were, the country by heart. Travelling in this way, a comparatively brief experience becomes greatly amplified. In the few weeks that we spent in the Kalahari, we had exactly the same travel interests as those who called it home. Our great concerns were the passability of the track from here to yonder, how deep might be the sand and whether native transport had ruined the road for motor traffic, where was the game and where the water. Through the recounting of these experiences it is hoped that the reader may have been able to capture some of the Kalahari overtones and to see the country through our eyes.

But there may be others who would wish to have more formal geographical data at their command before they can judge of the comparative harshness of the Central Australian and the Kalahari environment. For them the facts regarding temperature, rainfall, physiographic features, and the general conditions favorable or unfavorable to human habitation are pertinent.

Though the larger part of the interior of Australia and the whole of the Kalahari are plateau areas, their relief contours are very dissimilar. That of the Kalahari has been aptly described as shovel-shaped, the edges raised on each side of a wide shallow depression. The shovel is, however, tilted considerably to the west where the edge rises to an altitude of 6000 feet, with the Auas Mountains of Southwest Africa reaching 1500 feet higher still. The eastern edge of the Kalahari is somewhat lower, the extreme southwest corner at Mafeking having an altitude of 4200 feet, which drops to 3300 feet a hundred miles north at Gaberones, the point from which we struck west into the desert. In the extreme northeast of the region the highest land would be about 3600 feet at a point west of Matetsi, a station on the Bulawayo-Livingstone railway. The bottom of the trough would be about the Great Makarikari Salt Pan, whose height above sea level is 3000 feet.

Since the surrounding high veldt country is considerably higher, the altitude of Johannesburg being approximately 5700 feet, it will be seen that the Kalahari is not a separate plateau but rather a depression in the greater South African tableland.

In Australia, on the other hand, there is a south-central plateau rising gradually from Lake Eyre to the MacDonnell Ranges, reaching a general elevation of from 1500 to 2000 feet. Above this the central ranges rise another 2500 feet

and extend across the center of the continent from east to west between three and four hundred miles. Hence, we have these features of the interior of Australia as against the Kalahari—a general altitude 1500 feet lower, but a much more irregular contour, both of which differences would have important climatic effects. To pursue the comparison further, we might say that if the Kalahari in contour represents a shovel, the Australian interior would represent the same implement turned upside down and considerably battered, so that instead of the smoothness of the Kalahari, a high central ridge and marked depressions to the north and south-east would be apparent.

In all the vast area of the so-called Kalahari desert—270,000 square miles—there are but few eminences. Away from its edges these are but isolated kopjes, rising no higher than two or three hundred feet above its surface. For the most part, as we have seen, its surface is singularly featureless, being made up of low, broad undulations such as we crossed in the Southern Kalahari. To the south and east of Ghansi these undulations become narrower and sharper so that they can be described as dunes, rising to a height of from 50 to 100 feet. Undoubtedly great areas of the country would be covered by shifting dunes except that the sand is anchored by grasses and low thorn bush of the kinds previously mentioned. The chief grass is Bushman grass (*Aristida uniplumis*), while other kinds are known as Buffalo grass, thatch grass and kraal grass. Around Ghansi there is considerable country classed as “sweet veldt,” with a variety of herbage.

Information regarding much of the hitherto unknown Kalahari has been increased by a recent survey along the line of a proposed railway, to run between Southern Rhodesia and Walvis Bay, traversing the northern portion

of the Bechuanaland Protectorate in which the Kalahari lies.

Following a compass course Mr. Jeffares, a railway surveyor, crossed from Matetsi to Gobabis in Southwest Africa and his report has added considerably to our knowledge of the character of the country. Incidentally, it may be remarked, as illustrating the different terrain, that no such compass course could be followed in Central Australia.

A brief summary of the Jeffares report would show that between Eesterust and Rakops, a distance of 150 miles, there is a large area suitable for ranching, with an estimated carrying capacity of one beast to 25 or 30 acres of land. The average capacity of a similar stretch of 219 miles between Rakops and Matetsi in the opposite direction is given as one beast to 20 to 30 acres. Water must, of course, be obtained from wells. The Ghansi area with its surface springs is known to be good ranching country. The surveyors considered that the whole area served by the line would eventually carry 1,700,000 head of cattle and would support 200 to 250 "small" farmers, each on 15 square miles, plus 700 ranchers with 70 square miles per rancher, dependent of course, on sufficient water from wells and bore holes.

The great drawback to settlement and even travel in the Kalahari is the absence of surface water except in the Ngamiland region. That this area has undergone a prolonged period of increasing desiccation seems clear, as witnessed by the ancient river beds which are still to be traced for many miles in this region. Noteworthy among these old rivers are the Makoko, between Mopepe and Serowe, the Molopo in the extreme southeast, which once reached the Orange, and in the west the Chapman and Buitsevango rivers. Water may usually be obtained by digging in the sand of these river beds.

That portion of the Kalahari travelled by us does not seem to differ much from the area described by Jeffares. Colonel Rey journeyed from Kanye to Lehututu about 100 miles south of our line of travel. According to his report much of the country was well grassed, though very sparsely inhabited. Occasional cattle posts, belonging to the Baka-laghadi, were met with, and a feature of the country was the dry pans, similar to those seen by us.

But though there was little water Colonel Rey saw large herds of wildebeeste, springbok and also gemsbok. At one place his party gave help to a man who had been mauled by a leopard, and where there are leopards there must be game. His description of Lehututu is not, however, very alluring: "The tumble-down village," he writes, "lay on the edge of an enormous pan which reflected the terrific heat of the sun in waves of superheated air; a long way round it the grazing was eaten down or trampled out so that we saw not a blade of grass in any direction. The waterholes were muddier than usual and the cattle standing around seemed to be in the worst stages of thirst."

His report, however, shows photographs of open veldt where grass was apparently abundant. At one pan he saw a primitive irrigation project so that surface water was in some places obtainable. From his description and our experience, it is evident that the whole of the Kalahari south of the Botletle is remarkably uniform in character.

This uniformity is absent from the arid interior of Australia, which may be divided into four main areas. We have already alluded to the vast area of inland drainage, centering round Lakes Eyre, Frome, Gairdner, Torrens, and Blanche. Around Lake Eyre, particularly, romantic stories clustered, as an early airplane reconnaissance reported a large body of water surrounding what appeared to be large islands—pos-

sibly the last refuge of animals long extinct elsewhere in Australia and whose gigantic bones are found here and there in cave deposits.

But Madigan's expedition in 1929 showed that Lake Eyre, for all of its 3460 square miles of area, contained not a drop of water, as the airmen were able to taxi over its surface. The "islands" turned out to be cloud shadows on its surface, and if there were ever any Diprotodons in this region, their bones lay buried deep beneath the salt-encrusted gypsum mud that formed the bottom of the lake. As for the quarter of a million square miles that borders on this lake region, it has an average rainfall of five inches, and for aridity could not be matched by anything to be found in the Kalahari. Lake Eyre is, of course, quite off the central tableland, its surface being between thirty and forty feet below sea level. Apart from the occasionally flowing rivers which feed the lake, the only fresh water is to be obtained in the "mound springs" found mainly on the east side of the lake. These springs come bubbling to the surface and have built up deposits around them in the form of mounds. With such a terrifically arid area South Africa has nothing to compare.

To the north lies another desert region of 25,000 square miles designated as Simpson's Desert by Madigan and which is part of what Griffith Taylor calls the Arunta Desert. Mythical accounts of lakes and oases in this desert were also current, but Madigan characterizes it as a "dreadful sea of spinifex and sand ridges" and proved that its oases were as unsubstantial as Lake Eyre's shadow-islands. In this region sand ridges, 100 feet in height, will run in parallel lines for sometimes fifty miles before converging to make a junction like a capital Y. Madigan's description is worth quoting: "With its hundred mile long and parallel sand ridges it is topographically one of the most remarkable and

uniform areas in the world—but there appears to be nothing to warrant any further attempts by prospectors or pastoralists to penetrate it . . . a waterless waste of sand ridges and spinifex. It is no longer *terra incognita* but further acquaintance with it seems undesirable.”

Nor is the country much better to the southeast of Simpson's Desert, along the well known Birdsville track which runs from Marree to the southwest corner of Queensland. When Madigan reconnoitered it in 1929 it was at the time of my own visit to Central Australia, which was then nearing the end of a seven year drought, so that the track itself looked as if it could lead only from one desolation to another. The annual rainfall of this area is about 10 inches and it is thus perilously near the condition of desert. It, too, has its shifting sands and spinifex. Birdsville itself has a river—the Diamantina—close by, but the country around is not promising, “a desert destitute of anything but gibbers except sandhills, which approach within half a mile of the town.”

The third division in interior Australia which is characterized as “the central steppes” is the most promising as regards habitableness. At its center is the little settlement of Alice Springs, now the terminus of the railway. This area contains the larger part of the population of Central Australia and has already been sufficiently described. Its rainfall of eleven inches might seem adequate except for the fact that it occurs most irregularly. Alice Springs also lies in a belt where there are sometimes 150 consecutive days with temperature above 90° and many above 100°, so that the evaporation rate is estimated at eight feet a year. Hence it cannot be described as a very pleasant place to live, though the winter climate is delightful.

As one proceeds northward from Alice Springs, the aver-

age rainfall increases, though due to the uncertainty of the monsoons, irregularity is still a feature. Griffith Taylor¹ gives the average rainfall at Barrow Creek, 200 miles north of Alice Springs as 12.1 inches. But in 1904 it was 38.9 inches and in 1905, 3.8 inches. In one month more than the whole average rainfall has been known to fall. The balance is struck, of course, in the droughts.

Southwest of Alice Springs the steppes country extends as far as the Musgrave and Mann Ranges and ends in the Petermann Ranges in the extreme west. According to Fenner, the South Australian geographer, this part of Australia has a rainfall of less than 10 inches, very unreliable, mostly due to summer rains monsoonal in character. The presence of mountains, however, accounts for the occurrence of permanent springs.

Sweeping round the southwestern and western flanks of this highland backbone of central Australia is a vast empty desert region which for years defied explorers' most heroic efforts to cross. It took Giles three years of effort before he finally was able to traverse this region with camels, although Warburton was the first man to cross it with horses. The rainfall here amounts to less than 10 inches annually and the mean average temperature would be above 70°. Of this area Madigan writes: "Between the telegraph line (through Alice Springs) and the settled coast of Western Australia there still remained a thousand miles of unknown country. . . . Aborigines still roam in small groups in that desolate and almost waterless country." ² Though the author was speaking of a period of exploration nearly seventy years ago, the area is still in the same empty and barren state. It can hardly be now described as "unknown," but unfortunately

¹ Taylor, Griffith. *Environment and Race*, p. 246.

² Madigan, C. T. *Central Australia*.

there is nothing worth knowing. Immediately to the south, this desert area extends through the great treeless Nullarbor Plains, 400 miles wide where the East-West railway line crosses them, down to the Great Australian Bight.

Immediately a comparison is instituted between Central Australia and the Kalahari the disadvantages of the former, considered as racial environment, are obvious. The Kalahari has its 15 to 19 inch annual rainfall, an elevation of over 3000 feet to mitigate the temperature, no extremely lengthy periods of unbearable hot weather, not such frequent and prolonged droughts. Hence, it is, by all odds, a more habitable region. Its estimated carrying capacity of one beast to 30 acres may be compared with the one head of cattle and one sheep, to the square mile, which is to be found after forty years of settlement in Central Australia—this is, of course, comparing the areas in each country suitable for cattle. Including all the arid and semi-arid interior of Australia there would not be one head of cattle to ten square miles.

Sandhill country is probably the most unfavorable to human subsistence, but in the whole 275,000 square miles of the Kalahari, there would be a comparatively small area to be matched with similar areas in Australia. Griffith Taylor³ estimates that the sand hills in the latter continent extend from Ooldea on the transcontinental railway one thousand miles to Wollal in the northwest, and occupy half a million square miles, almost double the whole area of the Kalahari. To the east of Alice Springs he estimates there is another 70,000 miles of sandhill country. Yet aborigines have lived in and travelled through this country from time immemorial.

For those who would like to have a more exact description

³ Taylor, Griffith. *Environment and Race*, p. 282.

of what constitutes desert, we may turn to Fenner ⁴ who gives De Martonne's index of aridity based on mean annual temperature and rainfall. Indices below 5 indicate true deserts, while indices about 10 usually are characteristic of country classed as "dry steppes." This index of aridity for the Lake Eyre area would be 4.1, true desert, while the central highlands around the MacDonnell Ranges would have an index of 8, still below the steppes or grassland classification.

For the great western area between the settled parts of Western Australia and Alice Springs, including Gibson's Desert, the index of aridity could not be above 5, indicating that it is truly desert.

As regards the Kalahari, the case stands much differently. Taking the average rainfall as 15 inches (22 inches at Mafeking, 19 inches in the northern Kalahari, 10 inches in the west) and the mean annual temperature of 65°, I have calculated the index of aridity as being in the neighborhood of 13, well above the limits for desert country.

Koeppen ⁵ has given the areas of the main desert areas of earth, basing his index of aridity on temperature, rainfall and evaporation rate. He gives Australia's desert area as 1,100,000 square miles, second only in size to the Sahara, and that of the Kalahari as 90,000 square miles. Reference to his map, however, will show that almost all of this desert area is outside the Kalahari proper, or at least the Bechuanaland Protectorate, and extends along the coast of Southwest Africa. The part of the Kalahari in which the Bushmen are found lies entirely in the dry steppes region. Even if Southwest Africa were to be included, the desert area in Australia is twelve times greater.

As regards native population, Rey gives that of the Pro-

⁴ Fenner, Chas. E. *South Australia* Whitcomb and Tombs, Melbourne.

⁵ Quoted by Taylor, *op. cit.*, p. 279.

tectorate as 156,000, at least five times that of the more arid portions of Australia.

A comparison of native food resources would be overwhelmingly in favor of the Kalahari. It is worth noting that there is hardly a plant in Central Australia that can be considered an addition to the white man's larder. Apart from some waterfowl—where there is water—bustards, cockatoos, parrots, and kangaroos and wallabies there is no game worth mentioning, and what there is would be eaten only in case of need. There is no such thing as an expedition setting out with the expectation of living, except to a very limited degree, on the country.

During the course of my stay in the center I saw a single emu, two rock wallabies, a large lizard or pirinti, a couple of parrots, some eagles and half starved crows, and this despite the fact that I visited three of the largest springs and the only oasis in Central Australia. As a matter of fact I saw far more surface water there than I did in the Kalahari. Yet the contrast in the amount and variety of wild life in the latter region is most striking. I saw springbok, eland, hartebeeste, gemsbok, wildebeeste, duiker, steenbok, kudu, giraffes, ostriches, pauw, knorhaans (two species), guinea fowl, Kalahari pheasants, doves, starlings, jays. To these may be added monkeys, baboons, springhares, meerkats, and among the carnivores, lions, leopards, Cape hunting dogs, hyenas, and jackals. If the northern Kalahari were included, I should have to add elephant, hippopotamus, wart hog, zebra, impala, tsessebe, roan antelope, sable antelope, and buffalo. These were observed in the course of a comparatively brief stay in the country, although the fact that we visited the less known parts where game is comparatively undisturbed should be taken into account. Apart from water supplies we could have lived indefinitely on the country.

As regards plant food, I believe that here again the Bushmen find it easier to subsist than the Central Australians.⁶ Veldkos, as the various succulents, roots and tubers are called in Africa, seem to be fairly abundant. Schapera mentions, among the staple foods of the Bushmen, *Grewia* berries, uintjes (*Cyperus edulis*), *Bauhinia esculenta*, wild fig, palm nuts, omangete nuts, wild oranges and numerous other varieties of edible roots, berries, cucumbers, tubers, melons, and ground nuts, all of which he says appear in great profusion during and after the rainy season. But most important of all, and in my opinion outweighing in usefulness all the plant foods found in Australia, is the tsama melon, or khengwe. It is said that there is usually a good crop every second year and the fruit will remain on the ground over the dry winter season. The mokopane or spiked cucumber also yields both food and drink to the traveller, but is by no means as common as the tsama.

The Bushman larder is also augmented by ant eaters, ant bears, tortoises, frogs, porcupines, young bees and honey, termites, flying ants and ant eggs, while in the Okovango fish are caught in the traps and weirs.

When the tsama melon is on the ground, travel is easy for the Bushman, and rarely indeed is he driven to the Australian expedient of rising before daylight so as to brush the dew off the low scrub into a bark container, before the hot sun can lick it up. The presence of the tsama alone puts the Kalahari definitely ahead of the Australian environment as regards food resources.

It may, of course, be advanced as an objection to these comparisons that I saw the Australian aborigines' habitat at a most unfavorable time. In reply to this I can only point out

⁶ The situation is quite different in Queensland where food supplies exist in much greater variety and abundance. Roth gives a list of aboriginal foods.

again that it is to a country's worst aspects, to its vicissitudes and extremities that its indigenous people must be equal. As a place for human habitation, a land is no better than its worst drought. Notwithstanding this fact, it is possible to show that even at its best Australia is never an easy place to live in.

In 1902, Basedow, who later made extensive journeys into the less known parts of Australia and wrote a book on the Australian aborigines, joined a party which traversed the northwest of South Australia. This was the country explored by Giles, Gosse and Tietkens and is in the neighborhood of the Mann and Musgrave Ranges and extends north as far as Mts. Connor and Olga and Ayers Rock. The expedition was in the field for six months at a time when rain had been plentiful, the party having little difficulty in obtaining water for themselves and their camels. Hence, aboriginal food supplies were at their best. Several natives were members of the party and through them contact with the wild natives was constantly established. These wholly uncivilized aborigines camped alongside the whites and acted as guides. Basedow, therefore, had exceptional opportunities of observing the ways of these groups and was particularly interested in watching their hunting, and noting down all that they used for food.

I have collected from the pages of his Journal⁷ every reference to aboriginal provender. I find that he has mentioned twenty kinds of plants, twenty kinds of animals and eighteen species of birds, all of which are potential sources of food supply. Some of the birds and animals would be extremely difficult to capture.

Considering the time that the expedition was in the field,

⁷ Basedow. *J. of Government Northwest Expedition*. 1903.

the list is by no means impressive. The most important plant foods were yelka (*Cyperus rotundus*), portulacca or munyeroo, nardoo seed, native truffles (*Scleroderma* sp.), native fig (*Ficus platypoda*), quandong or native peach, plum (*Santalum lanceolatum*) and a variety of grass seeds, galls from eucalypts, wild gooseberries and mistletoe fruit. Apart from yelka, munyeroo and nardoo, the rest are of such infrequent occurrence that they cannot be considered as staple articles of diet.

Nardoo is a plant that grows in flooded clay pans in the good seasons, and in the dry its little black seeds, flattened on either side and about half a centimeter in diameter must be scraped up from the surface and skilfully winnowed from the clay dust, and then crushed to make a meal. Munyeroo is a plant that grows in clumps three feet across, of which both the leaves and seeds are edible. Yelka is a species of onion grass whose bulbs, about a centimeter in diameter, are dug from the sandy soil.

Incidentally, Tindale has described a strange way of getting food. Crows eat great quantities of currajong seeds and deposit them, only partly digested, around the rock holes. The natives gather these seeds, rub them in sand and then most skilfully winnow off the stones and foreign matter. The seeds are then broken and eaten.

The largest animals seen by Basedow's party were the scrub kangaroo (*Macropus rufus*) and the euro (*Macropus robustus*), which in weight would compare with a springbok. Smaller marsupials were the paddymelon or spinifex wallaby, the rock wallaby, neither of which would equal in weight a steenbok. In a still smaller class would come the rabbit-bandicoot, the opossum, the echidna, and the jerboa, a kangaroo rat. For the rest, snakes, mountain devils (*Mo-*

lochus horridus), blue tongued lizard, green caterpillars, witchetty grubs, cassus moths, rats and three species of land shells, make up the list.

From what has already been said this cannot in any way compare with the animal food available in the Kalahari. The Vernay-Laing collecting expedition which set out from Gaberones and proceeded northward through the Kalahari obtained no less than 162 species of mammals, beside which the Australian mammals would be extremely inadequate as food supplies, both as regards size and quantity.

In regard to birds, the Australian environment can compare with the Kalahari on more equal terms, at least in relation to variety of species. The largest of Australian birds is the emu, which of course is much smaller than the ostrich. Next in size would be the Australian bustard (*Otis australis*) and the wedge-tailed eagle. Among the others seen by Basedow's party were several species of wild duck (where there was permanent water), mallee hens, cockatoos, bronzewing pigeons, rock pigeons, boobook owls, podargus, curlews, wattlebirds, several species of parrots and crows. None of these, however, is as easily captured nor is found in such flocks as the guinea fowl of South Africa.

Some description of the food resources of the country northeast of Lake Eyre has been given by Horne and Aiston.⁸ This is one of the more favored localities because, though kangaroos and other animals except dingoes are scarce on these plains, the numerous clay pans and lagoons which are filled by the overflow from the Diamantina or Warburton, and the Cooper, contain in ordinary seasons abundant plant food.

Nardoo, yelka, and munyeroo are here, as elsewhere, the

⁸ Horne, G, and Aiston, G., *Savage Life in Central Australia*. Macmillan and Co., London, 1924.

staple foods but in addition there is the native cucumber, a yellow fruit covered with prickles and about 5 centimeters in length. In the flooded swamps the natives dig out wadroo roots. The taproot of this plant is about half an inch thick and three feet long and is eaten raw or cooked in the ashes. Mulga seed is also pounded up into a coarse meal.

Animals, mainly wild cats and an occasional kangaroo are not often seen. Emus are also scarce but *brolga* (*Antigone australiana*) or native companion, a large stork that inhabits plain country, is rather numerous. The rose-pink cockatoos or galahs are present in flocks of thousands. When there is water in the streams, fish are caught in traps and weirs.

Altogether, in every point of comparison, with the exception of the presence of surface water, the balance is in favor of the Kalahari. Droughts there are common, but are by no means as long continued and as disastrous as those of Central Australia. As a matter of fact, the Kalahari droughts seem to fall more heavily on the cattle owning agricultural Bechuana than on the Bushmen. When Colonel Rey^o passed along the lower Botletle in 1933, the natives in the villages had had no crops for two years and poor crops for four. When plans for their relief were outlined, they were very suspicious. "We have been hungry before," they said, "yet the Government never fed us. Why should the Government feed us now?"

This was the year before my visit, but though the country round Mopipi was still very dry there was considerable game, especially springbok. Had these Bechuanas been good hunters they would not have been in want.

In view of all the considerations enumerated in this chapter, I have no hesitation in affirming that the Central Austra-

^o Rey, C. F., *Report of Resident Commissioner's Tour of Bechuanaland Protectorate, May-June, 1933.*

lian environment is more repressive than the Kalahari. For the purposes of racial comparisons all that is necessary to do is to prove that it is equally repressive, but to put the matter in this way would be a decided understatement of fact. If now it can be shown that the Australians are at least the equals of the Bushmen in intelligence, it would seem to dispose of the view that differences in physical environment explain the cultural and social differences between races which are in turn invoked to explain the race differences in mentality.¹⁰

As regards use and mastery of environment, particularly in the matter of food resources, it would be difficult indeed to say which race, Bushmen or Australians, has the advantage. Considering the sparsity of food supplies in Australia, the people of that country must at least be equal to the African primitives. Fuller discussion of this topic must be at present reserved.

Hunting methods are, of course, very different since the Bushman is armed with the bow and poisoned arrow, the Australian with the spear. Many African tribes use the spear which usually has a metal blade. Other hunting tribes besides the Bushmen, such as the Wandarobo, use the poisoned arrow, while the bow and the metal tipped arrows are also used by tribes along the Limpopo and Zambezi. The Australian weapon being made of wood would be a very inferior weapon were it not for the use of the wommera or spear-thrower. This is a flattened piece of wood from two to four feet long, at one end of which is a little hook which fits into a hole at the end of the spear-shaft. By means of the leverage which the wommera supplies the spear can be hurled with great force and accuracy, its effective range being up to 100 yards.

¹⁰ See preface to Klineberg's *Race Differences*.

The great defect of the spear in dealing with game that lives in open country like the Kalahari, is that the hunter must expose himself more than if he used the bow and arrow. His quarry is much less disturbed if the latter weapon is used. At the same time while there is little timber in the Kalahari there is ample cover which might be used for stalking. Another disadvantage as regards the spear in this country is the fact that a bundle of these weapons cannot be carried with the same ease as a quiver of arrows. The boomerang, the distinctive Australian weapon, is used mainly for small game, with which, however, the Kalahari is well stocked.

Considering among other things the Bushman's hunting skill and his knowledge of poisons to use with his arrows, we may concede, for the present, that his mastery of his environment is equal to that of the Australians. This does not mean, of course, that life is equally easy in both countries. I do not doubt that a tribe of Australian aborigines would grow fat in the Kalahari. It should be remembered that my visit there took place one year after the worst drought that had been experienced for years, yet game was plentiful, and to an Australian aboriginal's eyes would have seemed superabundant.

CHAPTER XIV

RACIAL DIFFERENCES IN MENTALITY

HAVING compared the habitats of the Bushmen and the Australian aborigines with special reference to their use and mastery of environment, we must now consider whether there are demonstrable mental differences between the two racial groups. Before proceeding with these mental comparisons, it is advisable to pay some attention to the tests and measurements which have been applied in racial studies and particularly to the criticisms that have been offered against their use. These criticisms have been referred to rather generally in Chapter I, but should now be considered more specifically.

By mental or intellectual differences are meant comparative abilities to use the abstract symbols of thought, and to acquire that kind of education which seems essential to adequate functioning in civilization as it is constituted. It is, however, necessary to go further than that and to include among the important mental abilities an intelligent prevision of the adequacy of means to ends. I would also include among the intellectual qualities the ability to control impulsive or other behavior that would, if unchecked, obviate or nullify the effects of good planning. These qualities of foresight and control are to be considered intellectual because the cortex, the coping stone of brain development is, *par excellence*, the organ of choice and inhibition.

At the outset of this discussion I would freely admit the fact that the tests and measurements that have been used for

demonstrating these intellectual differences are by no means fully adequate. That this is so does not mean that the methods are of no value. The science of mental testing is still very young and the fact that one hundred per cent proof of mental differences between races has not yet been possible does not justify us in throwing the whole case out of court, as some would do, or in demanding the Scotch verdict of "not proven." The evidence is not yet all in, yet its main trends are apparent.

In all controversial matters, patience and moderation are at a premium because they are so rarely found. The claims of those who would exalt the importance of race have often been made with such arrogance and disregard of facts that perhaps we should forgive a too dogmatic tone on the part of those who would refute those claims. For example, Klineberg, who has written the finest critical survey of the evidence from the point of view of the race equalitarians that has yet appeared, ends his book on a very positive note. In speaking of the attempt to change the attitude of children to races other than their own, he speaks of the "knowledge that every single one of the arguments used in order to prove the inferiority of other races has amounted to nothing."¹ This seems to be a sweeping conclusion that Klineberg's own survey of the question by no means supports. Similarly, Bruno Lasker,² in reviewing this same volume, says, "Instead of wishing this excellent book many editions, we may therefore hope rather that it will take its place at or near the end of an immense quasi-scientific literature that has led into a blind alley." Even allowing for Lasker's sympathy for the under-dog—a feeling which I decidedly share—this statement is too pontifical in tone. There is also a slur implied in

¹ *Race Differences*, p. 349.

² Lasker, Bruno. *Pacific Affairs*, Sept. 1936, p. 490.

the term "quasi-scientific" which is not applicable to most of the racial investigations so far completed. True science is the honest pursuit of truth by the best means at hand—whether it ever catches up to the truth is immaterial. To suggest that studies, whose conclusions are in some points not beyond dispute, are quasi-scientific seems to me rather ungracious.

For my own part, I must confess that my combativeness is roused most easily by presumptuous or arrogant claims. The fact that such claims are often made on behalf of race does not, however, dispose me to belittle the evidence that exists in favor of racial differences. I may agree that some of the proof of these differences may be vitiated by disregard of certain conditions, without assenting to the view that racial studies lead only into a blind alley. It is sometimes necessary to match aggressiveness with asperity, but neither has a rightful place in scientific discussions, where it may be presumed we are all honestly seeking the truth. As was pointed out in the introduction, I am not concerned with proving racial superiority or the reverse, but merely with investigating the extent and significance of racial differences. For example, I am quite ready to admit, on the basis of my experience, that, in his own environment, under his own cultural conditions, the African native or the Australian aboriginal is not only equal, but superior to the white man. He is a better animal—and that is saying a lot in his favor. He can endure the pains of existence with a fortitude of which I am utterly incapable. Anyone who has witnessed the victims' hardihood when suffering a circumcision or subincision operation by means of a stone knife will not doubt the stark courage of the native.

If humor be defined, not as the ability to see a subtle joke, but as the ability to keep a cheery spirit in the face of the

most depressing circumstances of poverty and injustice, then the African has a decidedly superior sense of humor—and humor, after all, is the saving social grace.

If also the ability to support the rigors of a terrifying environment is everyday courage, then the Australian aboriginal is much braver than I. If the assurance that life is essentially worth living under any circumstances is more firmly set in the African native's mind than in mine, then I must give him credit for a more effective foresight and hindsight than I possess. There may be many other ways in which the black man be considered superior and his contributions on the credit side of living should be freely acknowledged. But when it comes to his ability to cope with the white man's environment, which by reason of so-called progress, or of the turn of circumstances, has been thrust upon negro and aboriginal alike, then I cannot but question their adaptability, especially that of the Australian. The latter, in his natural surroundings is so far superior to the white man, that if he were even equal to the white man in the latter's environment it would be most surprising. If that were the case he would soon inherit the earth.

The assumption that racial differences in mentality do exist seems to me entirely reasonable, provided we are convinced of the fact of individual differences. Klineberg is careful to affirm his belief in these individual differences, not only in the statement quoted by me in Chapter I but again in discussing the influence of nurtural factors on racial comparisons. He says: "The writer wishes to emphasize his view that these factors do not explain away individual differences in mental test performance," and then goes on to give his opinion that the evidence for such differences is irrelevant to the issue.

For my part this evidence seems to me to be distinctly relevant. A racial group is merely an aggregation of indi-

viduals; the same tests are applied to the members of the racial group as are used to demonstrate individual differences, and in the best investigations are applied individually; with regard to scholastic ability the bright can be differentiated from the dull just as readily in the case of aboriginals as in other races; lastly the same objections as to cultural influences on test performance can be invoked with regard to the individual as they can to the racial group, though those influences may not operate with the same general force. Why, then, should we accept the tests for individuals and deny them all validity when applied to groups?

The fact, then, that a racial group is merely a collection of individuals surely has some relevancy. If that group has been segregated, geographically or otherwise, from other groups for a lengthy period of time, differences in the original stocks may easily tend to become perpetuated by heredity in the race. The racial average in tested intelligence may then differ from that of other groups. In the case of a race like the Australians, who have undoubtedly been segregated for an immense period of time, and who are probably the descendants of a very small immigrant group, the differences are likely to be more marked. Then, too, in such a peculiar environment as Australia affords, it may well be that natural selection may operate in such a way as to accentuate those differences still further.

As a matter of fact, I think that every investigator of experience with native races would agree with Klineberg that environmental factors cannot be ignored in any valid interpretation of test results, but I should hardly concur entirely with the dictum of Garrett and Schneck when they say that "comparisons are only permissible when environmental differences are absent, or at least negligible." Again

I would ask, why should not this apply also to individual comparisons?

In order to clear the ground it may be as well to take up the question in detail as to what these environmental factors are that so seriously affect mental test comparisons and to consider in what ways they could be eliminated or reduced to a minimum. In this discussion I shall follow Klineberg's own admirable summary, adding some objections of my own and presenting them in somewhat different order. The chief factors tending partially to invalidate the results are as follows:

1. *Language Difficulties.* Many of the racial comparisons that have been made have been through the application of the Binet or its variants. In a Binet examination a composite series of tests is given, including among others vocabulary, detecting the absurdities in statements, descriptions of objects and pictures, verbal ingenuity (finding rhymes, putting together scrambled sentences), defining abstract words and the like. Quite obviously, such tests cannot be fairly applied to racial groups whose mother tongue is not English or whose command over English is very limited. Yet tests such as the Binet and Alpha Army have been used, quite mistakenly, in racial comparisons.

2. *Effect of Education.* The influence of schooling varies with the type of test used, being greatest with verbal tests that seek to measure such things as general information, arithmetical skill and the like, and being least in the case of performance tests which deal with concrete material such as color blocks, mechanical devices, mazes and the like.

There should be included here, however, a factor not mentioned by Klineberg. I believe that the effect of schooling on performance tests is not related to the test content but rather to the whole test situation. The person who has gone to

school is used to being confronted with mental problems and attacks them with much less uncertainty and hesitation. He has what is called a favorable mental set towards the problem. This, I think, accounts for the fact that children often do better on performance tests than adults, and explains also why "bush natives" do not usually do as well as those who have had some contact with whites.

3. *Social and Economic Status.* These factors undoubtedly have a bearing on test performance, children from superior homes, or persons from a superior class having, on the average, better scores. Obviously, as Klineberg remarks, it is difficult to say what is cause and what is effect; "whether people are in the upper economic levels because they are more intelligent, or whether they do better on the tests because of their superior opportunities." My own answer to this question would be that both explanations are in part correct. Rural school children do not usually measure up to city children, but it must be remembered that the improvement to be gained by moving to a better environment has its definite limits.

4. *Other Cultural Factors.* Under this heading are included several things which affect test performance, but which do not affect all races equally. Speed is one of the most noteworthy of these. The child in the Western world is expected to regulate his life by the clock, whereas the need for hurry is seldom recognized by primitive folk. Hence, it is not fair to compare the performance of natives on tests scored on speed with that of whites or other civilized groups in whose lives haste is often at a premium.

Then, too, there is familiarity with the test content. Quite obviously, performance is affected by this factor. As an example, we may take a missing feature test in which the subject was supposed to detect the fact that a chimney was

lacking in a house. In Hawaii nothing could be wrong with such a picture as 95 per cent of the houses have no chimneys. Similarly, it would be unfair to expect the native to do well with material that has no place in his own cultural background. This is a special difficulty with tests that use pictures. The number of things that are universally known is decidedly limited.

Certain cultural attitudes besides speed of response should be taken into account. The Oriental child, like the American Indian, would rather not attempt a task unless he is entirely sure of success. This attitude is not usually characteristic of whites.

5. *Emotional Factors*. Fear and suspicion of the unfamiliar may also affect results. In the case of an experienced investigator, especially one with anthropological experience, emotional disturbance of this kind should be easily allayed. My own experience with natives is that they do not distrust the white man's magic as much as their own. Provided the examiner makes the initial approaches in the right way, there is usually no difficulty on this score. Some individuals display nervousness but their number is no greater or as great as the whites who are nervously confused and "rattled" when faced with a new task. This is an individual rather than a racial matter.

6. *Rapport*. In connection with the above factors, it is most essential to establish the right relation between examiner and subject. Klineberg suggests that I do not recognize the importance of *rapport*, because, as he says, "Porteus . . . included among his (Australian) subjects one convicted murderer whose test performance was complicated by a chain on his leg and a police constable standing over him with a gun."

On the contrary, the *rapport* was excellent. Gurug, the

man in question, was the prize captive of the Wyndham police. They were extremely proud of having been able to bring him in over three hundred miles of untracked country, and were not taking any chances of his escape. As for Gurug himself, my visit to the jail probably made the one bright spot in his incarceration, for he became so interested in the tests that I am sure he would have stayed to finish the task even if all precautions had been relaxed. I expect I have given at least 20,000 individual examinations by the Maze test and am not likely to mistake the signs of interest.

7. *Motivation.* This is linked up directly with the question of interest and social background. Referring again to my studies of Australians, Klineberg quotes the fact that my subjects were sometimes puzzled by the fact that I would give them no assistance on the tests even when I was examining my tribal brothers in a group of which I was considered a member. While this was true, it did not materially affect the results, since the subject as soon as he found that he must depend on his own efforts usually went ahead, and if the task was interesting to him, looked for no further assistance. In other cases my subjects were over-concerned with failure, showing most evident chagrin when a mistake was made. This, however, applies particularly to the Maze test, and in that test care and prudence are at a premium.

With regard to interest, it is decidedly unsafe to decide in advance of experience what will appeal and what will not appeal to the native mind. As I have elsewhere pointed out, the idea that bright colors appeal to savages of themselves and not in relation to their use is a mistaken one, and if it were true would indicate that the primitive's level of interest is a decidedly childish one. He may be interested in a bright shawl or blanket but the idea that he would prefer colored blocks to plain in a construction test is rather far-fetched.

8. *Other Pitfalls.* Among the drawbacks encountered in the testing of primitive people is one not mentioned by Klineberg but which must be guarded against, and this is misapprehension of the nature of the test. In the Maze test, for example, the task set the subject is to trace his way through a series of increasingly complicated maze designs. Unless the examiner is experienced he may find the subject giving most of his attention to drawing a straight line immediately in the center of the maze path. This is not due, as some have suggested, to unfamiliarity with the use of the pencil, but a misconception as to what is required in the test. The remedy is to demonstrate the first test over again, drawing the lines carelessly, but stopping very deliberately at each blind alley.

As a matter of fact, people such as the Australian aborigines are quite apt in drawing or scoring lines, making very careful and complicated designs on boomerangs, shields, etc. In times past, the capacity of the Bushmen for drawing was beyond dispute. My experience is that primitives have usually very considerable manual dexterity.

Having considered the criticisms which are justifiably levelled against mental test comparisons, it is only fair to remark that they do not apply equally, either in number or degree, to all investigations. Yet Klineberg would seem to imply that such is the case when he says: "It should be added that although *no one* of these factors accounts by itself for the observed racial differences, the combination of *all* of them, acting in different ways and to a variable extent depending upon specific circumstances, may very well be responsible."^{*} There may be studies in which *all* of these factors apply but they are hardly worth serious consideration.

^{*} *Race Differences*, p. 177.

For example, tests applied to primitive peoples which depended on language, which used entirely unfamiliar test material belonging in another culture, or which proved uninteresting to the subjects, or were scored on speed (except in comparing groups equally handicapped in this respect), or in which the examiner failed to establish proper *rappport* between himself and his subjects, would hardly be worth the trouble of applying and certainly would deserve scant consideration as evidence of racial differences. To adopt what safeguards are possible against such weaknesses in the testing program would be the first concern of the experienced examiner.

There remain the disparities in general cultural, social, economic and educational status. As we have seen, it is very difficult if not impossible, to determine what influence these inequalities have on test performance. The obvious safeguard is to carry out the comparisons with groups in which the disparity is non-existent or has been reduced to a minimum.

Because Hawaii has among its population such groups, and provides in fact a unique set-up for racial investigations, I would like to present the general results ⁴ of several studies which indicate that there is considerable evidence for differences between races that are at a higher level than the Bushmen and Australians, with whom this volume deals.

Briefly set forth, the conditions of the investigations to be cited are:

1. The tests chosen for application are of the performance type and therefore independent of language.

⁴ Average scores only are given here, merely to show the trend of the comparisons. The results will be published in proper statistical detail in a forthcoming monograph.

2. Whites, because of their superior social status, were excluded from the comparisons.

3. The subjects were Japanese, Chinese, Filipinos, and Portuguese children whose parents were of equivalent social and economic status, having all been brought as contract laborers to work on sugar plantations. For comparative purposes a part-Hawaiian group was included.

4. All the subjects had been educated in the same school system through the medium of the same language.

5. Practically all had been born in the Islands so that length of residence was not a factor.

The investigations with their results may be listed as follows:

Study No. 1. The subjects were unselected Chinese, Japanese, Portuguese, Filipino and Part-Hawaiian boys of various ages from 9 to 14 years, the numbers in each age group being approximately equal. The test used was the Porteus Maze, a non-language test, which has already been described. The results are given in Table I.

TABLE I

MAZE TEST RESULTS—UNSELECTED BOYS

ALL AGES			14 YEAR GROUPS		
No.	Race	Average T.Q.	No.	Race	Average T.Q.
228	Japanese	102	42	Japanese	95
95	Part-Hawaiians	100	33	Part-Hawaiians	93.3
140	Filipinos	96	36	Chinese	92
200	Chinese	95.3	23	Filipinos	89
97	Portuguese	91.5	34	Portuguese	88.5

It will be seen from this table that the Japanese head the list followed by the Part-Hawaiians. This favorable position of the latter is in part due to the relatively high score of the nine-year-old boys of this group. Except for the fact that the Chinese improve their position, the order of the racial groups is the same when only 14-year-old boys are compared.

Study No. 2. The subjects were boys of the same racial groups as in Study No. 1, except that the Part-Hawaiian group was broken up into Hawaiian, Chinese-Hawaiian and White-Hawaiian. The ages were from 9 to 18 years and all subjects were attending Honolulu schools.

The test used was the Form and Assembling Test. In this the subject first matches 23 duplicate pictures of parts of a hammer, wheelbarrow, knife, coffee pot and chair and then assembles the two parts of the wheelbarrow, three of the knife, and four of the coffee pot and eleven of the chair. His score is given as mental age based on his total time, and from this age the test quotient has been calculated.

TABLE II
RACIAL PERFORMANCE ON FORM AND ASSEMBLING TEST

BOYS			GIRLS		
No.	Race	Average T.Q.	No.	Race	Average T.Q.
228	Japanese	106.1	191	Japanese	103.3
259	White-Hawaiian	104.8	170	Chinese	100.8
114	Chinese	102.2	207	White-Hawaiian	100.7
145	Chinese-Hawaiian	101.7	121	Chinese-Hawaiian	95.2
94	Hawaiian	97.7	186	Portuguese	92
102	Portuguese	93.9	77	Hawaiian	89.1

In this study also the Japanese head the list, while the Portuguese as before are either at, or next to the bottom of the list.

Study No. 3. The subjects were of the same racial groups with the addition of the Puerto Ricans and consisted of individuals of various ages who had been referred to the Psychological Clinic of the University of Hawaii. They included the dull or retarded, delinquents, and defectives—in short the educational and social misfits. They therefore represent, not the average, but a sampling from the subaverage levels of the population. The test used was the Porteus Maze.

TABLE III
PERFORMANCE OF CLINIC CASES—PORTEUS MAZE

No	Race	Average T Q
1087	Japanese	92
353	Hawaiian	88
570	Chinese	88
162	Filipino	87
720	Portuguese	79
241	Puerto-Ricans	76

The similarity in rank orders of these racial groups to those in Table I should be noted. The Japanese as before head the list and the Portuguese are near the bottom.

Study No. 4. In order to test the standardization of the Maze test, which had been slightly modified, 2,764 unselected school children of various ages were examined in the Honolulu Public Schools. The results grouped racially are given in Table IV. In this case the numbers of Filipinos and Puerto Ricans were too small for inclusion.

TABLE IV
MAZE TEST PERFORMANCE—UNSELECTED SCHOOL CHILDREN

No.	Race	Average T Q
781	Japanese	99.4
451	Part-Hawaiian	95.8
864	Chinese	89.6
167	Portuguese	86.2

Here again, as in all the other performance test results, pride of place belongs with the Japanese, no less than 10 points of T Q. level separating them from the Chinese. As before the Portuguese occupy last place.

Study No. 5. Japanese superiority in performance tests of planning capacity seemed so consistent that I determined to examine their capacity in relation to that of the Chinese and Portuguese in a test of ability for design. Six matches were given each subject and they were asked to arrange them in as many distinct designs as possible, with no gaps between the matches and with all the ends in contact. There are eleven possible designs and scores are allotted in such a way as to accord least credit to the commonest designs. This is a ten minute test. Scores are given in Table V. Ages were equivalent in each group.

TABLE V

No	Race	Average Score
200	Japanese	13.47
197	Chinese	11.75
118	Portuguese	10.61

Here as elsewhere the Japanese take first place.

From these studies it must not be assumed that the Japanese are in all points superior to the Chinese, but only in performance tests. As far as tests of a more literate character are concerned, the position is reversed and the Chinese seem to hold a small, though constant superiority. As regards rote memory, which seems to have a fairly direct relation to scholastic progress in the elementary grades of school, the Chinese again have a slight advantage. As far as these results can be relied upon the Chinese seem to have better abstract intelligence, but the Japanese have better practical intelligence. Again, the matter is one of racial differences, not of superiority or the reverse.

The samples tested cannot, of course, be presumed to be wholly representative of the two races in their own countries. It can be assumed, however, that the two samples compared were drawn from approximately equivalent levels in the two populations.

Another conclusion that may be safely reached from consideration of the studies presented is that as far as the white race is concerned the differences should be called natio-mental rather than racial. The low position of the Portuguese is significant of this fact. But it must also be remembered that the tests used are only very partial measures of intelligence, in the broad sense that we have defined the word. It may well be that the tests used do not examine the special abilities characteristic of the Portuguese and hence do not represent their level of intelligence fairly.

CHAPTER XV

ABORIGINAL MAZE TEST PERFORMANCE

KLINEBERG's criticisms of the results of mental comparisons of races have been so skilfully phrased and cunningly marshalled that the uncritical reader, whose name is legion, might easily be misled into thinking that his verdict of "not proven" means that there are no race differences in mentality. I have therefore felt it necessary to cite in the foregoing chapter certain investigations¹ carried on by the Psychological Clinic at the University of Hawaii, to which the aforesaid criticisms either do not apply or are of negligible importance. In this way the ground has been cleared for the comparison of the two primitive races with which we are now concerned.

My Australian subjects consisted of 120 adult males, who were divided into two or three groups according to the districts in which they lived. The first work was done with the natives at the Beagle Bay Mission some 86 miles from Broome on the northwest coast of Western Australia. This mission had been originally established by the Trappists and had then been taken over by the Pallottine order. Altogether the mission had been in operation for forty years.

¹ It will be noted that I have not calculated the significance of the differences between the Japanese and other races by using the formula usually applied in such cases. By means of this procedure the investigator might be able to state that the chances are 9,567 (or some such figure) in 10,000 that the Japanese are superior. Such a statement is merely ridiculous. We do not require one man to outrun another 9,000 times before we decide that he excels in running ability. The fact that the Japanese are superior in five trials and that the superiority is observable at each age level is quite sufficient.

The natives mainly belonged to the Nyul Nyul tribe, but included among them were some Baadi, a neighboring tribe whose territory extended to the extreme tip of Dampier Land at Cape Leveque.

Under the supervision of the Brothers, the natives carried on various activities around the mission. They had supplied the labor used in building the church, workshops, and the various buildings used for residences. Some worked on the farm raising vegetables which were taken by the mission truck to be sold in Broome. Others of the aborigines worked as carpenters, blacksmiths, and one, a full blood aboriginal, was a rough but fairly competent harness maker. A ketch or lugger, manned by a half-caste captain and an aboriginal crew brought supplies to the mission and shipped away hides, etc., the products of the mission ranch, or as it is called in Australia, a cattle run.

This provided the main industry. Under one of the Brothers who acted as manager, some of the younger, more active natives worked as stockmen or cowboys, mustering the cattle, branding the calves, and attending to the numerous windmills upon which supplies of water from various wells depended. A considerable number of half-castes lived in the houses which made up what was called the mission colony.

Apart from the natives who were regularly employed in the work of the place, there was a group who were to be found in the mission "camp." These were mainly the older natives with their families who lived under the headmanship of an old black named Felix, and who came and went as they pleased, hunting over their own territories, and returning to the mission at intervals to draw rations consisting mainly of tea and sugar, and occasionally a little flour. The rest of their sustenance they obtained from the bush. It was these older, rather unregenerate natives that were responsible for

the continuance of native customs and the survival of much of their own culture and social organization. After the tribal council was assured of my good will and genuine interest, I was admitted to ceremonies that were quite unknown to the mission authorities, notwithstanding their long years of association with the blacks. Had they been present at some of these doings that took place within a half-mile of the church, I am afraid that the good Brothers would have been shocked to find some of their converts participating wholeheartedly in dances and ceremonial observances that were decidedly pagan. Because I showed some understanding of their everyday psychology, the natives were quite eager to show me as much as they could pertaining to their secret life. They very early disassociated me from the mission authorities, and no doubt, regarded me as unregenerate as themselves.

From Beagle Bay my party proceeded northward to a branch mission at a place called Lombadina about fifty miles distant. There was a cattle station close by and the place was near the coast so that contact with whites was by no means lacking. At Cape Leveque, sixty miles further on, we were able to get in touch with the blacks of Sunday Island, which some of the party visited.

After returning to Broome we set off on the track to Wyndham, traversing first of all 350 miles of the Fitzroy River Valley. Beyond this valley lies Moola Bulla, a cattle station established by the Government for the benefit of the aborigines, the idea being that if the natives had cattle of their own they would give up the reprehensible habit of spearing the white settlers' stock, to which they were formerly much addicted, to say nothing of sporadic attacks on the settlers themselves and their native helpers.

At the station homestead, which is under white manager-

ship, there is always a group of natives who assist with the work but at intervals "go bush" with their families. Government rations are regularly distributed. At the time of my visit most of the tribe were away gathering bamboos for spears and food supplies for a large ceremonial gathering of the tribes that was to take place at the beginning of the ensuing wet season. These natives also had had considerable contact with whites, both residents and travellers.

The next group was examined at Violet Valley, a branch of the Moola Bulla station, ninety miles away. The natives here, belonging to the Keidja tribe, also work under white supervision, looking after the cattle on the range. The last aborigines examined in the Kimberley district were some prisoners in the jail at Wyndham, three of whom were murderers in the eyes of the law, but merely tribal executioners in the native view. Two of them spoke good English and were among the most intelligent of my subjects.

This group of Kimberley and Dampier Land natives inhabited country which has been previously described as being from the standpoint of food supplies some of the most favorable for aboriginal occupation in Australia. Bird life around Beagle Bay was extraordinary in its profusion, while animal life was abundant. On the way to Cape Leveque we saw many wallabies and kangaroos, while the aboriginal larder could be well supplied with rock oysters, cockles, sea slugs and other marine delicacies. Rock pythons were also numerous.

All through the Kimberleys, a distance of 700 miles, food supplies are abundant. Apart from the extreme discomfort of heat, flies and mosquitoes in the wet season, life here was comparatively easy for the aborigines.

From Wyndham I returned to Perth and proceeded thence to Alice Springs through country which has already been

described. I made my headquarters at Hermannsburg where I was in contact with Arunta and Luritcha natives.

The mission at Hermannsburg is run by the Lutheran Church and like Beagle Bay consisted of buildings erected by aboriginal labor under white supervision. Both missions had been established for forty years and each had closed down for several years in the interim. Both also are cattle stations, but Beagle Bay had more white industries represented. Hermannsburg held an immense acreage but the terrific drought had ruined the cattle business.

The natives, even men not normally connected with the mission, were being supported mainly by Government rations in return for some rough track-clearing on the way to Palm Valley. Rain after six years' drought seemed as far away as ever. Even the crows were starving and the three camels that brought water from the springs five miles away were so weak that about ten gallons each made a full load. The mission people, however, were still cheerful and spoke hopefully of good seasons and brought us photographs to prove that the Missionaries Plain, now so desolate, was once covered with grass, waist high.

I had come to Central Australia to compare the environmental conditions of its natives with those of the northwest and to measure, if possible, the effects on mentality. The comparison of the two groups of aborigines seemed to me to be reasonable from the standpoint of cultural advantage. Both had been under mission influence for the same length of time, with equal opportunities for education. As far as general contact with whites was concerned, it seemed to me that the advantage, if any, was on the side of the north-western group. As to physical environment, the reader will appreciate that the odds were overwhelmingly against the Central Australians.

Greatly to my surprise the results of practically all the comparisons were in favor of the latter group. Even in the less consequential physical characteristics such as head measurements and consequent brain size, in stature, in strength of grip, back strength, back and leg strength, the Arunta of the center had the advantage. Only in arm-shoulder strength and vital capacity were the northwestern group superior. The last named measurement was taken by means of the wet spirometer and very few of my subjects in either group made a satisfactory adjustment to the instrument.

As regards the mental comparisons, the Arunta had a decided advantage in the Maze Test, and a lesser but significant superiority in the Form and Assembling, Goddard Form Board, memory for digits, the Knox cube test, and the Goodenough Drawing Test. Only in the Dot Estimation did the Nyul Nyul of Beagle Bay have the better records.²

These results were striking as they seemed to run counter to the common sociological theory that deficiencies in mental status of groups are directly related to the depressing effects of unfavorable environment. It must be said, however, that the cultural equality of the two groups was not accepted without question. In a review of the book that presented these results, Professor Elkin, who had visited and worked in both the center and northwest, attempted to explain the differences in performance and made several criticisms of my conclusions, mainly on the following grounds.

The natives at Hermannsburg, he says, have enjoyed an advantage in that instruction at the mission has been given to them in their own language. "The white man's religion, moral ideas and plans for work are discussed with the natives in Arunta, and this has enabled the aborigines to get

² For the full discussion of this data see Chapter XXII of *The Psychology of a Primitive People*.

some insight into civilized modes of thought. When the psychologist arrived they were better able to understand his aims than their countrymen of the northwest. Would that the psychologist could have explained his tests in Arunta!"³

To this it may be replied that the tests used were of the performance type in which a minimum of verbal explanation is necessary. Whenever instructions were required they were given in pidgin English, which was used among both the Nyul Nyul and Arunta. If further instructions had been given in the latter's own language, then, according to Professor Elkin's own explanation, the Arunta superiority would have been more apparent. But in any case it is too much to expect that knowledge of the white man's religion, moral ideas, etc., would have a bearing on mental test performance.

To my mind general cultural contact with whites will have a greater influence than language in familiarizing the native with the white man's way of doing things and his general purposes. Many of the natives in both groups had gone to school and hence had the right mental "set" towards tests. Some of the Nyul Nyul had visited Broome, a town of 2,000 inhabitants, and had been employed in the pearl fishing industry. Beagle Bay's contacts with civilization were closer and more numerous than Hermannsburg's and more of the white man's industries were represented in the former mission. Nor was communication with the Nyul Nyul entirely by means of pidgin English, since the Brother in charge of the cattle station spoke their language fluently. Furthermore, the Arunta all used pidgin English.

As to the constitution of the groups, there were more "bush" natives among the central group since their numbers had been augmented by the arrival of some desert Luritja,

³ Elkin, A. P. "The Social Life and Intelligence of the Australian Aborigine." A review of S. D. Porteus's *Psychology of a Primitive People*. *Oceania*, Sept. 1932, pp. 101-113.

several of whom were included in the cases examined. Strangely enough, despite the fact that these latter did not know a word even of pidgin English, a couple of them made excellent scores. At Hermannsburg also there were very few, if any, half-castes,⁴ while at Beagle Bay they were well represented, and were useful in communicating the white man's purposes to the rest. In every respect I consider that the advantages of cultural contact with whites lay with the Nyul Nyul.

Professor Elkin also remarks that the ordinary sociological investigator, in discussing matters of tribal lore and custom, fails to discover any differences in intelligence between the natives of the two groups in question. Since such investigators deal mainly with individual informants and not with the group, and naturally seek out the most intelligent, their opportunities for estimation of the general level of mentality are limited. If the facts could be gained in this way, there would be no need for the psychologist to institute comparisons.

The verdict of equal capacity based on the experiences of white employers—another point cited by Elkin—should carry little weight, since these are notoriously poor judges of aboriginal mentality. Some of the most outrageously biased opinions as to the capacity of the natives were expressed in my hearing by various white employers in the Kimberley districts.

Since we cannot rely on opinion, we must, it seems, have recourse to the tests. Professor Elkin goes over very carefully the limitations that I myself pointed out with regard to these; namely, that otherwise excellent tests had to be discarded because of language difficulties; that test material had to be limited to items that were not wholly unfamiliar

⁴ Full bloods only were included in both studies.

to the aborigines; that, in some cases, especially the tests of muscular efficiency, they were not of equal interest to the natives, and that little reliance could be placed on tests scored on speed, since hurrying with a task was not the aboriginal's habit. Nevertheless, it is surely apparent that all these limitations applied just as fully to the tests when used with the central aborigines as they did when used with the Nyul Nyul, and hence the results are quite properly comparable.

The test which has been most widely used with primitive peoples is the Maze, and before proceeding with the African results it might be well to give a brief account of this test and a summary of previous investigations in which it has been used.

This test was devised in 1913 in order to obtain a measure of the practical intelligence of children who were being segregated from other school children for the purpose of educating them in special schools and classes. It was hoped that it would prove to be a valuable supplement to the Binet tests, especially in helping the psychologist to distinguish between the merely dull and those who lacked social adaptability to such a degree that they were "unable to manage themselves and their affairs with ordinary prudence"—to quote from a legal definition of feeble-mindedness. Since the publication of these tests in 1915, they have been increasingly used in the diagnosis of mental deficiency. A great number of studies have been carried out with the Maze tests and the claim that they test the capacities of prudence, foresight and mental alertness has been generally accepted. These studies are to be found in a number of publications and there is no need to list them here.⁵

⁵ Fortes (*Man*, April 1932) has suggested that while the Maze test may measure the abilities of whites to adjust within our culture, it is fallacious to suppose that it is diagnostic of the capacity of blacks to adapt themselves to that culture. The argument, to my mind, is very dubious.

The first application of these tests to primitives took place in 1915 when I examined a number of half-caste and full-blood children belonging to the Narrinyeri tribe at the Point McLeay Mission in South Australia. This small study showed that the younger children tended to score relatively higher than older ones, indicating a tendency to precocity in development. As a matter of fact, the children below ten years made records equal to white children of equal age. As the native children grew older they tended to lose ground.

Another investigation with children as subjects was made by Mr. and Mrs. Ralph Piddington, who received training in the giving of tests at the University of Hawaii. They used several tests, including the Porteus Maze Test, and remark, "This test was given to all the subjects examined, and proved to be by far the most valuable of the entire battery." However, they go on to point out what they regard as a remarkable discrepancy between the performance of the mission children at Beagle Bay and that of the "bush" natives at La Grange, a station to the south of Broome where they carried out their chief studies. The median test quotient of the mission school children was 91, almost equal to that of white children, while the "bush" natives (adults) had a median record of only 9.5 years. The authors offer this comment, "Taking the figures at their face value . . . , 50 per cent of the aborigines examined obtained scores lower than those of the average white child of ten years of age. The results thus became ludicrous when contrasted with the performance of the mission children, and in the writers' opinion, demonstrate conclusively that mental tests (even of the 'performance' variety) are quite unsuited to natives reared in a primitive environment, though they may be profitably applied to natives who have had a minimum of schooling." ⁶

⁶ Piddington, Marjorie and Ralph. Report of Field Work in North-western Australia, *Oceania*, March, 1932.

However, the results are not to be taken "at their face value." It so happens that in performance in the Maze test there is a constant sex difference in favor of males, who excel females at every age in every racial group that has been tested. For example, the average score of males in the northwest was 10.477 years, that of females 8.22 years—a quite marked "discrepancy." Unfortunately, the Piddingtons disregarded the sex difference and included the scores of 14 females in their results. Segregating these scores I found that the women averaged only 8.6 years, as compared with 8.22 years in my study. The average score of Piddingtons' males was 10.52 years⁷ as against 10.477 years according to my results. Hence, their results are in remarkable agreement with my own. We had both worked in different parts of the same district and the outcome was so similar as to suggest considerable dependability as regards the test.

Turning now to the results with children, let us see whether the high score may not be due to the inclusion of younger children who tend to score relatively high. Here again the Piddingtons' data, when analyzed, provide striking confirmation of the findings I had previously obtained. Their group was much younger than the group I had examined at the same mission at Beagle Bay, averaging 9.51 years in actual age as against 12.4 years in my study. The respective mental ages in the two studies were 9.26 (test quotient 97) and in mine 10.11 years (test quotient 82). It will be seen that there was a decided drop in test quotient with age. If the scores of children 9 years and younger are excluded from the Piddingtons' data there is then no marked discrepancy between the bush natives' scores and those of the mission children.

⁷ Calculated from a copy of the data kindly forwarded to me by Mr. Piddington.

If the cases 10 years and over are considered together and the scores of several cases whom I had examined previously are substituted in the Piddington data ^a then the boys' average was 10.5 years, while the girls' average mental age was 10.12. If this boys' average is compared with that of Piddingtons' bush natives, it will be found to be almost exactly the same (10.52). It is possible that mission schooling does confer some advantage but if so it is probably not more than one-half year in ultimate mental age, as will be seen by Miss Stoneman's data which are given later. These results would indicate that there is not much improvement in aborigines' scores in the Maze after about 12 years. The important point in this discussion is that the apparently "ludicrous" discrepancy between the adult males' and the mission boys' scores has in the final analysis disappeared.

The question of the effect of environmental and cultural handicaps on Maze test scores is of course a very pertinent one. If there are any such—and I would not deny that there may be—they act very unevenly. One of the Luritcha whom I examined at Hermannsburg had just come in from the desert, and had never seen pencil or paper in his life, knew no English, and was quite unfamiliar with white men and their purposes; yet he obtained an almost perfect score. Three of the Piddingtons' bush natives also received the highest possible scores.

Fry and Pulleine ^a have reported the results of psychological work undertaken in Central Australia at a place called MacDonald Downs, 200 miles northeast of Alice Springs and about 300 miles from where I did similar work.

^a In a second application of the Maze tests to the same subjects, there is usually a decided improvement due to practise. At least five of the children examined by me were re-examined by the Piddingtons.

^a Fry, H. K., and Pulleine, R. H. "The Mentality of the Australian Aborigine," *The Aust. J. of Exper. Biol. and Med. Science*, Vol. VIII, 1931

Their subjects were men of the Iliaura tribe; "most had made their first acquaintance with whites in the last six years and could speak no English at all; none had command of more than a few words of English." These were decidedly "bush" natives.

The authors note the interest the aborigines took in the tests, stating that the Porteus Maze tests "caught on more successfully than any other performance tests." They go on to say, "While watching a native at work on these problems, one can almost feel the intensity of the mental strain involved." This accords well with my own experience.

I well recall sitting down at Lombadina testing a grizzled old black one morning when rain was threatening and I was most anxious to return to my base camp. Half an inch of rain would have made the black soil plains impassable for a couple of weeks. Nevertheless, I could not hurry the old fellow nor take the tests from him. He was half blind and I had to sit patiently for an hour until the old man triumphantly made his way through the designs. Piddington also notes his subjects' interest. They were so concerned with their performance that they "expressed distress when a line in the maze was accidentally crossed." As previously noted, they can be too concerned with drawing the lines straight. The perfunctory way in which the natives attacked certain other tests is in striking contrast. The Bushmen's interest has already been mentioned, although they did not take the test as seriously as did the Australians.

In passing, Fry and Pulleine's experiences with testing women should be quoted. "In a test of color preference they could not be induced even to exhibit sufficient mental activity to select beads of one color rather than another but just appropriated the nearest sample. The dullness on the part

of the women would appear to be due to the absence of intellectual stimulation in their lives.”¹⁰

I have calculated from Fry and Pulleine's data the average mental age of their male subjects using the method of scoring that is uniform with my own, and find it to be 10.7, which is close to the results obtained by me for northwestern natives, but is more than one year below the average score of the Arunta. It is noteworthy, moreover, that one of their subjects obtained a perfect score.

Through the courtesy of Miss Stoneman, State psychologist, who collected the data in Western Australia, I am able to present results of another small study of aboriginal children attending schools under her supervision. Her subjects were 12, 13 and 14 years old with an average chronological age of 13.3 years, at which level mental development may be considered to have about ceased. Thirteen boys scored 11.1 years and 20 girls 10.6 years. If the results are compared with the Piddingtons', there is a difference of about .6 of a year in average mental age. The Piddingtons' cases were younger than Stoneman's and if we assume that 11.1 years would be approximately the ultimate level reached by the Beagle Bay children then the difference between them and the "bush" natives would be .58 of a year.

For convenience' sake the results of the above mentioned investigations are collected in Table VI. It will be seen that the average Australian aboriginal adult scores about 11 years mental age in the Maze Test.

Because of the difficulties of travel, etc., and the sparsity of aboriginal population, the numbers of subjects in these investigations are necessarily small. Nevertheless, the results are remarkably uniform. Taking the adult males to-

¹⁰ As elsewhere noted, the Bushman women seemed to me much more alert and less suspicious and repressed than the Australian. Unfortunately I had no time for testing the Masarwa women.

gether we have 133 cases with an average test age of 10.9 years, or in round numbers 11 years, with a resultant test quotient of 80. The average test age of the five groups of children examined would be about 10.5 years. Chronologically they would average about 12½ years, which would make their average test quotient about 84.

TABLE VI
ABORIGINAL MAZE TEST PERFORMANCE

Subjects	Tribes	Locality	Examiner	No	Average Mental Age Years
Half-caste Boys	Mixed	W Austraha	Stoneman	13	11.1
Half-caste Girls	"	"	"	20	10.6
Boys over 10 yrs	Nyul Nyul	Beagle Bay	Piddington		10.5
Girls over 10 yrs	"	"	"		10.12
Children— mixed sexes	"	"	Porteus	22	10.11
Adult Females	Karadjeri	La Grange Bay	Piddington	14	8.6
" "	Keidja	Kimberleys	Porteus	11	8.22
Adult Males	Arunta	Hermannsburg	Porteus	25	12.08
" "	Mixed	Moore River	"	14	11.32
" "	Iliaura	MacDonald Downs	Fry-Pulleine	10	10.7*
" "	Karadjeri	La Grange Bay	Piddington	24	10.52
" "	Nyul Nyul— Keidja	Kimberleys	Porteus	65	10.48

* This figure is approximate as the investigators did not use the standard method of application.

CHAPTER XVI

AFRICAN STUDIES

WE may now turn to the consideration of the South African results which will include not only those of the Bushmen but of various other tribal groups belonging to the Bantu people. These latter were examined for the sake of fuller comparisons as I thought it advisable to measure the Australians not only against the Bushmen but against other tribes in South Africa who are admittedly of much higher cultural status than the desert people. In this way the Australian performance can be better evaluated.

The Bushmen, as will be gathered from the narrative of our travels, constituted a small group of twenty-five adult males drawn from the southern, north central and northern portions of the Kalahari. It was a matter of extreme regret to me that I did not have time to visit Southwest Africa where Bushmen are more numerous.

I limited my subjects to those who had had a minimum of contact with whites and who were still living on the veldt rather than those employed by the Bechuana as cattle herders and servants. Perhaps the Australian group that would most nearly compare with them would be the Karadjeri natives examined by Piddington at La Grange Bay, or the Illiaura examined by Fry and Pulleine. To make the comparisons entirely fair, we will match the Bushman performance against the lowest scores made by Australian adult males.

As far as I could judge, the Bushmen were quite inter-

ested in the Maze test material, as my experience on the Mababe Flats would surely indicate. With each group examined the testing and measuring took three or four days, during which time the natives had an opportunity to get used to the presence of the examiner and to discuss the testing among themselves. The services of interpreters, Raumkavideo in the Southern Kalahari, Kakumba in the Mababe, and a native corporal of police at Kachikau, were used to explain the nature of the tests, each having been himself first examined. After this preliminary explanation, the interpreter's services were limited to standing by during the examination in case some additional instructions were required. The testing laboratory was set up under a convenient tree, the wind being held off by putting up my camp canvas as a screen. Gifts of tobacco and colored handkerchiefs were made to each subject at the conclusion of his examination. The Bushmen were consequently quite anxious to take the test. Though they were told that only four or five men would be needed on a given day, all the Bushmen at Kachikau turned up each day and sat around in a group until the whole performance was finished.

Despite this interest, the Bushmen made a very poor showing in the Maze test, their average score being only 7.56 years. When this is compared with that of the Karadjeri at La Grange (10.52 years) or the whole northwestern group examined in the Kimberleys (10.48 years), it is seen to be decidedly low. It is, of course, hopelessly outclassed by the average performance of the Central Australians (Arunta and Luritcha group), which was over 12 years.

It must, of course, be remembered that the Arunta were in contact with a mission and that some, though by no means all, had attended the mission school. The Bushmen on the other hand had had no contact with missions, for, as far as

I am aware, no mission to the Masarwa has ever been for any length of time successfully established. The question then arises as to how the Australians compare with African tribes who have had similar advantages. Fortunately I am able to supply such comparative data, gathered from a wide geographical range and inclusive of both mission and kraal natives, and therefore comparable with both the mission and bush aborigines of Australia.

The first group consisted of Wakaranga examined at the Morgenster Mission, situated some four miles from the famous ruins of Great Zimbabwe. Since one theory ascribes the building of these to the natives, a word of description with regard to these structures may be given. They consist of what have been named the Temple, the Acropolis, and the Valley of Ruins and constitute the great archaeological puzzle of Africa. The Temple, roughly circular in outline, is surrounded by massive stone walls thirty-five feet high built of dressed stone blocks laid entirely without mortar. No inscriptions of any kind have been found here, but in one place the upper courses of stones have been built so as to form a well-marked chevron pattern, while at intervals carved soapstone pillars, surmounted by birds' heads, are placed on the walls. Inside, the space is divided by parallel passages and rectangular enclosures, not unlike the interior of a king's kraal, and at one place a mysterious conical tower has been built to the level of the outside wall.

The Acropolis surmounts a hill near-by and overlooks the Temple. Its purpose was evidently defensive, for ingress can be gained only through very narrow passages and advantage has been taken of huge granite boulders and rock faces to build the walls in such a way that from three directions at least the place is almost unapproachable. On the fourth side, however, the hill can be quite easily scaled and access

gained to granite tors which overlook the fortifications, if such they were.

Since there are no historical records of these great structures, scientific and popular imagination has had full play with regard to their origin. The date of their building has been variously estimated from 1500 B.C. down to the twelfth and thirteenth centuries and they have even been attributed to the Phoenicians who were supposed to have used them to guard the mines from which King Solomon obtained the gold that built his temple. Ancient gold workings do exist, but about one hundred miles from the spot.

Since Miss Caton-Thompson's excavations, scientific opinion seems to lean strongly towards the theory that the ruins are the work of Bantu hands and date back only six or seven hundred years. Notwithstanding the archaeological evidence, there seems to be a psychological gap in the theory—and that is the lack of a sufficient motive for their construction. Considering the country that lies at the back of Zimbabwe—country that is most admirably suited to guerilla warfare of the kind to which many Bantu tribes are accustomed—it is difficult to see why they should wall themselves up in such strong places. These look more like the work of an invading people seeking to maintain itself in a hostile country.

Morgenster Mission is well within this country and is, I think, the most picturesquely situated place that I saw in South Africa. Beyond and around it lies an apparently confused jumble of granite topped hills. These are covered for the most part with thick forest, which does much to soften their otherwise harsh outlines. Here and there, however, the grey granite heaves itself up above the sea of vegetation in massive pinnacles and smoothly weathered monoliths. On the lower slopes the forest has had its way and flows around

the scattered boulders, covering them with green mosses among which the stems of many orchid plants find a lodgment. In other places the hilltop is one unbroken cap of granite, bare of all growth except on the lower edges where the rock scales off in huge sheets leaving cracks lined with the green of ferns and the red of flowering aloes. At many such places you may find a little spring issuing forth and flowing down to feed the tiny hidden streams which seem to flow in every direction between the maze of kopjes. Clinging to the sides of the hills close to the springs or hiding under the shelter of rough hills are the kraals of the natives, and each evening the Wakaranga herd boys drive the cattle up from the swampy valleys to the stockaded cattle posts below the hilltops. Even there they are not always safe from the leopards, for while we were at the Mission news came one morning that their cattle kraal had been invaded and a beast killed.

With a thousand square miles of this kind of country to take refuge in, it seemed a strange thing to me that the Wakaranga should have built themselves strongholds like Zimbabwe, which could easily be surrounded and besieged by superior forces. Water, too, would need to be stored, for I could find no trace of a spring, the ruins being built right at the edge of the forest country where it is much drier. From such considerations it would seem as if the mystery of Zimbabwe as regards the motivation of its builders is not yet satisfactorily solved.

If, however, the Wakaranga were the builders of Zimbabwe, they have degenerated considerably since that day. Such dry stone work as they carry out at the present time seems very inferior and as far as the tests went I could find no evidence of superior planning capacity or practical intelligence. During the week that we stayed at Morgenster my

wife and I were able to examine 32 natives, who scored on the average 11.57 years in the Maze test, noticeably below the level of the Arunta at Hermannsburg. In choosing subjects for examination at Morgenster we took only those who were in the fourth standard or about midway through the school course. The chronological age of these boys would center around 19 years and in almost all cases schooling had begun in the kraal schools carried on by native teachers under government or mission supervision. It was obviously impossible for us to test the pupils of all standards, which ranged from the first to the seventh. The fourth standard should, however, represent the average in intelligence and schooling. It was indeed surprising to find the despised Australian blacks, currently supposed to be near the bottom of the scale in mentality, and certainly much lower in cultural and economic status than the Wakaranga, comparing so favorably with them in this test.

Our next group of cases was examined at Mt. Selinda, situated just on the boundary line between Southern Rhodesia and Portuguese East Africa. This mission station was about 200 miles from Morgenster, the road crossing a ford over the Sabi River at Moodie's Drift. The natives belonged to what are called the Vandau, having a considerable mixture of Zulu blood.

These people have had an interesting history. Manikusa¹ or Sotshangaana was one of Tchaka's generals who for lack of success or insufficient booty obtained in a raid, or for some other reason, incurred the Zulu tyrant's anger and deemed it best to flee from his master. He and his Shangaans went north, crossed the Limpopo and at the Sabi River met and defeated the Angoni, another Zulu horde. They then spread out to the north and east subjugating

¹ Also spelled Manukosi by Junod.

other Bantu tribes such as the Vandau, who were already settled in the country.

In 1833 Manikusa captured Lourenço Marques, and three years later he took Sofala, leaving none of the Portuguese garrisons alive. From then till his death in 1861 he ruled the country. After his passing his two sons, Mzila and Mweme, contended for the chieftainship and the former, assisted by the Portuguese, who had reestablished themselves in the country, after many bloody battles became victorious. By this time the Portuguese had established their ascendancy over the tribes and Gunganyane, Mzila's son, negotiated in vain for British protection. In 1893 this chief was persuaded to move with his people into Portuguese territory. As soon as the Portuguese had him in their power they exiled him to the Azores. Some of the Vandau then drifted back to their former homes.

In 1893 after several surveys of the country the American Board of Missions set up the mission at its present site. It is most picturesquely placed in the midst of a great forest of cedar which occupies several thousand acres at the top of a range of mountains overlooking the low veldt of Portuguese territory. The trees are straight and tall, in some areas averaging at least 150 feet in height. It is a wonderful forest harboring bush buck, leopards, and an occasional lion which strays up from the low country. We secured a very fine skin of one which had been raiding the mission's cattle. Close by, over the Portuguese border, are quantities of game of all kinds, including elephants.

The Vandau struck us as being somewhat more alert than the Wakaranga but that may be because they were taught only in English, while the latter heard both Dutch and English spoken. Both missions had been in operation for about forty years and both conducted training schools for native

teachers. In order to offset any possible advantage accruing to the Vandau through the greater use of English, boys were examined from Standard III as well as Standard IV. The average score in the Maze test of 43 cases was 11.41 years, just a fraction of a year below that of the Wakaranga and only slightly above the performance of the small group of Australian aborigines examined at Moore River, Western Australia, but below the Arunta.

The third group of mission natives examined were Bathonga in attendance at the school at Lemana in the northern Transvaal. Lemana is situated about 14 miles from Louis Trichardt, named after the Boer trekker who first settled in this Zoutpansberg district. The old site of the Mission was at the very edge of a steep escarpment from which one can look into the low veldt populated by the Shangaans of the Lower Limpopo. Thus the country of the Bathonga lay between the Matabele on the west and the Shangaans on the east. Their lands were harried and the people oppressed by both of these Zulu groups. If they fled from Umsilikatze, chief of the bloodthirsty Matabele, they fell into the hands of Manikusa. As a consequence of these enforced contacts the original clans, the Maguamba, the Bapedi and the Bathonga, suffered considerable infusions of Zulu blood. Hence, both the Vandau, 200 miles north, and the Bathonga were dominated by the Zulus. Indeed, most of the whites called the Bathonga Shangaans, but they much preferred to be known by their own tribal name.

In all probability, more is known of the customs of the Bathonga than of any other single tribe. This is due to the labors of Junod, one of the Swiss missionaries who worked among these people for a while at Lemana, but for the most part in Portuguese East Africa. From his book *The Life of a South African Tribe* the following brief account of

the anthropological background of these people has been taken.

Bathonga are to be found in four of the states of South Africa, Northern Natal, Portuguese East Africa, Southern Rhodesia and Northern Transvaal. The name Shangaan often applied to them really belongs with their Zulu conquerors, as this was one of Manikusa's names. In the Northern Transvaal the Bathonga are immigrant clans who sought to remove themselves from too close proximity to Manikusa and settled down among the Bavenda and other tribes. Another large group settled at Spelonken to the north of the present site of the mission.

The Thonga language with its various dialects remained distinct from that of the Zulus, though it was necessary for the subject tribes to know the language of their masters. The women, however, spoke their own tongue and as Junod remarks, "The women are the best safeguards of the purity of the language amongst primitive people."²

The customs of the Bathonga conform in general outline to the usual Bantu pattern. As an example we may take the widespread belief that all life is related in a mysterious way. When a child is born, married people who are having intercourse regularly are excluded from the hut because if one of them were to touch the baby it would die. Evidently the new life must not come into close contact or competition with the beginnings of life elsewhere, or even with the life-giving process which may be going on in others.³ Though the child is born he is not yet established in life. After he has begun to crawl the parents again have intercourse and semen is smeared over a string which is then tied around the child's waist. If another pregnancy should occur before

² Junod, Henri A., *The Life of a South African Tribe*. Neuchatel, Switzerland, 1912.

³ This is my own interpretation of the facts, not Junod's.

the child is weaned, it would be a decided threat to his survival. Two to three years must elapse before the next birth. Should another child be conceived before this time it is said to have "crossed the way of the first born," or "to have cut his road." The husband is blamed severely if a second conception takes place and any illness which the child suffers is ascribed to the parents' indecent haste in resuming marital relations. Like many other primitive practices, this custom has a decided value—in this case helping to prevent overpopulation.

This idea of a sharing of the life essence among the members of the one family is reflected in other beliefs. When a second child cuts his teeth they are supposed to be pushing out the teeth of the elder brother. The competition for the life essence must be diminished by spacing the births. Hence, it is easy to see why twins are thought to be unnatural and abhorrent and were usually destroyed. At Morgenster Mission there is a nursery of twenty children abandoned by their parents because they were either twins or had cut their upper teeth before their lower ones. The Bechuana have similar ideas regarding the interrelationship of life. When a woman is pregnant the husband must not go with another woman, though at other times extra-marital relations with his *nytsi* or sweetheart (often another married woman) are permissible. If two men have had relations with the same woman they should not travel in company. If one should fall sick, the other must not visit him or the patient will die. "They have dipped together in the one life through the blood of that woman," the natives say, "they have drunk from the same pool." If one should run a thorn into his foot the other must not pull it out for him. If one dies the other must not assist in the mourning ceremonies. Another striking taboo is that a pregnant woman must not visit a diseased person.

Everywhere new life competes with old, and life and death are continuous.

Some such philosophy seems to be general among the Bantu, for Mackenzie found it among the Bulu, a branch of the race living in equatorial Africa. "The problem for the Bulu," she writes, "is how to appropriate a share, or it may be a double share, in that precious commodity which he conceives as an element, immanent and manageable, if one but knew the secret! For his little vessel—the vessel of his body, with its content of life—is without protection, without, let us say, a lid. His treasure is in a violable vessel. There is more life and there is less; there are thieves of life and acts of theft; spirit thieves and mortal thieves. There is a flux of the precious essence."

As with the Australians, the Bathonga youth's entrance into manhood and full tribal membership is a most important event and depends on his success in passing all the tests of the circumcision school. For three months the boys are segregated while they go through all manner of trials, particularly of their fortitude in withstanding blows, cold, thirst, and unsavory and insufficient food. In this initiation they acquire a most wholesome respect for their elders and the tribal regulations and taboos. The ritual, under pain of death, must be kept strictly secret from the women and the uninitiated. While Tchaka did away with the circumcision school for military reasons, its use persisted among the Bathonga.

Wives are obtained through a *lobola* payment of oxen or hoes; or at the present time, of money. As has been frequently pointed out, this "bride-wealth" is more than a price: it is the guarantee that children will be forthcoming, as in the case of sterility, the *lobola* can be reclaimed. It is usual in such cases, however, for the parents to provide the

husband with a substitute wife—often a sister—to avoid the return of the *lobola*, which has probably been used to obtain a wife for the bride's brother. Hence, a special relationship is set up between a child and his maternal uncle, since the cattle which were paid for the child's mother have been applied to the advantage of the uncle in securing him a wife. It is interesting to speculate as to whether this special relation between uncle and uterine nephew, which exists widely elsewhere, may not have had its basis at one time in a similar bride-price system. As in Australia, avoidance of the mother-in-law is also practised.

Coming now to the mentality of the Bathonga we find Junod commenting very favorably on their remarkable memory for stories. He says that some of these people can repeat a tale lasting for five or ten minutes, after having heard it twice or thrice only. It would, I think, be rather hard to find out how often it had been heard, as the Bantu are great story-tellers.

Junod also comments on Dudley Kidd's statement ⁴ that mental development in the African native is arrested at puberty. He agrees in part with this view for he writes: "It may be said that the vivacity of mind, the rapidity of comprehension which is sometimes wonderful in younger boys decreases when they reach the age of fifteen or sixteen years." ⁵ He points out, however, that this arrest or slowing down of development is not universal.

It has already been noted that an attempt was made to limit the cases examined by me to the middle school standards. Unfortunately, at Lemana I was able to get only a few boys from Standard IV so made up the quota mainly from Standard VI. As I had not examined any cases elsewhere at

⁴ Kidd, Dudley. *Savage Childhood*, p. 119.

⁵ *The Life of a South African Tribe*, p. 100.

this higher educational level, an attempt was made to equalize matters by including some in Standard III. As a result the advantage of educational selection was with the Bathonga. This would not be important except that it probably represented a selection by intelligence also, as only the brighter pupils could get past Standards IV and V. This selection may be reflected in some of the test results. In the Maze test the Bathonga slightly excelled both the other mission groups.

In order to make the inter-racial comparisons as fair as possible, it was determined to examine groups of kraal natives who had had no schooling and could not speak English. The inclusion of these would enable me to compare Australian mission trained cases with African mission trained, and "raw" African natives with Australian "bush" aborigines. At the same time the raw or kraal natives would act as control groups for mission school trainees.

These "raw" natives were examined at the W.N.L.A.* compound in Johannesburg and consisted of Shangaans, Mchopi, and Amaxosa. The first two groups were recruited from Portuguese East Africa and the Amaxosa are a Zulu tribe living in the northeast of the Cape Province.

The compound itself provided us with a most interesting place in which to work. Here the natives of all tribes are brought for medical examination before being drafted to the various mines for work. A quarter of a million natives are required and these all, at one time or another, pass through the W.N.L.A. compound, the minimum stay being two or three days. Here there was to be seen a cross section of the native population of South Africa—Swazis, Pondos, Basutos, Tembu, Fingoes, Bechuana, Zulus, Mchopi, Shangaans, and

* Witwatersrand Native Labor Association. My thanks are due to Mr. Wellbeloved, an officer of the Association, and to Mr. Du Plessis, manager of the compound, for permission and opportunity to do this work.

Amaxosa, all herded together with, for the nonce, the tribal divisions lost to view.

They were dressed in all kinds of habiliments from gaudy blankets to cast off European clothes and aviators' suits. Women's hats, straw "deckers," woollen nightcaps, German helmets and all varieties of caps and slouch hats made up their headgear, while as additional adornment they wore native jewelry, motor goggles, and in some cases huge curtain rings or safety pins dangling from their ears. The weather was cold and they stood in groups or lay on the ground swathed from head to foot in cheap blankets, so neatly folded that how they could possibly cover themselves so completely remained to us a mystery. A chrysalis in a cocoon is not better enfolded. Some that were not sleeping sat around smoking and talking; others amused themselves on the swings and slides provided for their recreation. But by far the greatest attraction was a large baboon chained to a post and almost all day a ring of men three and four deep stood by, teasing the animal. On a couple of occasions the animal has broken loose and has bitten some of the natives severely.

Either to obtain the money to pay the family head tax, or to *lobola* a wife, or merely to make a display of wealth in the village some of the men enlist two or three times. At the end of their contract, they may be seen returning home carrying along the most miscellaneous collection of odds and ends as presents to their people.

As interpreter and general helper we had the services of one of the native staff, a Zulu, who brought us our subjects and kept away interested onlookers. None of these raw natives had probably ever been so close to a white woman before, and Mrs. Porteus found it best to allow her subjects to gaze their fill before attempting to draw their attention to

the tests in hand. The Amaxosa were particularly filthy and unkempt so she one day enquired of our helper, "Can't you get me a clean one?"

"No, Madam," was his reply. "This nation are all dirty."

Unfamiliarity with white women may have affected adversely some of the scores, but it must be remembered that Mrs. Piddington assisted with the examination of some of the bush Karadjeri natives in Australia so that they also should have suffered a like handicap.

In considering the differences in Maze test scores of some of the groups, it should be remembered that the idea of a maze or a labyrinth is within the cultural experience of certain natives. Dudley Kidd⁷ describes a game which is played by Kafir children as follows:

"Labyrinths in the sand are made by the clever boys, who make their designs with amazing rapidity. Duller boys are lost in wonder when they see big boys making these things. The big boy kneels down on one knee, and, reaching out with his forefinger, makes a thin groove in the sand with his finger. The chief's hut is supposed to be in the centre, and a maze is built around it. Some of these designs are very clever and ingenious. This is one of the few boyish games which survive into adult life amongst the Kafirs."

Another game in which the same qualities of foresight and prudence are required as in the maze is thus described by Kidd. "The most famous of all games, however, is not played by small children, for they cannot grasp the rules. The game is called *Morubaraba* in Basutoland, and *Tsoro* in Gazaland. It is played with a large flat stone, or a plank of wood, in which a number of small holes are bored out in four rows as if for a modified game of solitaire. Two or more stones of different colors are chosen and placed in these

⁷ *Savage Childhood*, p. 170.

holes. They are moved about as in a game of draughts. The game can be played equally well by making a number of small holes in the ground—the natives at the Johannesburg compounds being very fond of playing the game. Thus the game is said to be played all over Africa.”⁸

The game is also described in more detail by Junod⁹ under the name *tshuba*. He quotes Culin as authority for the statement that it is “a variety of *mancala*, the national game of Africa,” which is also played in many other countries. The rules are something the same as for chess or checkers so that to win a player must plan all his moves in advance.

It is evident that games involving a situation very similar to that presented in the Maze test are well known in Africa. The Australians on the other hand do not play games of this nature. Hence, any advantage accruing from familiarity with the test situation should lie with the Africans.

Notwithstanding this fact, the kraal natives with the exception of the Amaxosa, who play the labyrinth game, are quite markedly inferior to the Australian bush natives. The Amaxosa scored 10.78 years in the Maze as against the Karadjeri 10.52 years, but the Shangaans averaged only 9.3 years and the Mchopi 8.34 years.

Apart from the evident superiority of the Australians, especially of the Arunta, the comparisons are entirely in favor of the mission as against the raw natives. How much of this advantage comes through schooling and how much is actually due to selection, through the more intelligent being gathered into the mission schools, I am not prepared to say. It would be difficult indeed to see how the learning of school subjects could add to the foresight and prudence of the indi-

⁸ *Savage Childhood*, p. 174.

⁹ *The Life of a South African Tribe*, Vol. I, p. 315.

vidual in solving a maze. I am inclined to think, however, that it is a more favorable mental set towards problems in general that is acquired in school. Apart altogether from this question of the effect of education is the surprisingly good showing of the Australian aborigines, who are not only on a level with the Bantu groups but decidedly outclass the Bushmen.

For the sake of a more comprehensive view of the results, the Maze performances of the Africans and the comparable Australian groups are gathered together in Table VII.

TABLE VII
MAZE TEST PERFORMANCE—AFRICANS AND AUSTRALIANS

No Cases	Tribe	Locality	Schooling	Test Age Average	S D.
25	Arunta	C Australia	Mission	12.08	2.09
29	Bathonga	N. Transvaal	"	11.72	2.22
32	Wakaranga	S Rhodesia	"	11.57	2.17
43	Ndau	S Rhodesia	"	11.41	2.2
14	Mixed	W. Australia	Govt. Station	11.32	...
25	Amaxosa	Cape Province	None	10.78	2.76
24	Karadjeri	N. W. Australia	"	10.52	2.6
65	Keidja-Nyul	N. W. Australia	Nyul-Mission	10.477	2.34
25	Shangaans	Port. E. Africa	None	9.3	2.66
28	Mchopi	Port. E. Africa	"	8.34	2.45
25	Bushmen	Kalahari	"	7.56	2.17

A warning should be given, and emphasized, that the Maze is by itself far from being a satisfactory measure of intelligence. All we can say of it is that the complex of qualities needed for its performance seem to be valuable in making adjustments to our kind of society. No matter what we

think of the matter, it is our kind of society which is being imposed on the native. Perhaps imposed is not the word. The native himself desires our culture and will do everything in his power to acquire it, and in fact is much more in a hurry to accept civilization than we are to give it to him. I rather imagine that in his own tribal ways, foresight and planning are not of so much value to the ordinary man; but considering the direction of the acculturation process, the question as to who is the most intelligent *by native standards* is beside the mark.

CHAPTER XVII

ASIATIC PRIMITIVES

IN the consideration of the mental results obtained with the Australian aborigines, proper evaluation was difficult because there was no comparable data available that had been collected among similarly primitive peoples. These results had to be stated in terms of norms obtained from white subjects. Hence, when it was found that the average mental age by a certain test was, let us say, ten or eleven years, there was considerable hesitancy in accepting the situation. The tendency among some readers seemed to be to attack those results on the basis of the unfairness of the application of white norms to aborigines. Unfortunately, the only comparative data that I could present at that time was that collected among Chinese, Japanese and other racial groups of admittedly higher cultural status in Hawaii. In the present volume it has been my aim to include as much material on other more or less primitive¹ peoples as possible, so that neither directly nor indirectly need white subjects be drawn into the comparisons.

Aided by a small grant from the research funds allotted to the University of Hawaii by the Rockefeller Foundation, Mr. Kilton Stewart was enabled to accompany an anthropological expedition conducted by Mr. H. D. Noone, government ethnographer, whose headquarters are at the Perak Museum in the Federated Malay States. Mr. Noone has for some years been interested in the ethnography of the so-

¹ "Primitive" is here used, not in the physical sense but the cultural.

called aboriginal tribes of the Malay Peninsula and very kindly provided Mr. Stewart with the opportunity to examine a representative group of the mountain Sakai, or Senoi, as they are variously called. At a later date Mr. Stewart continued his studies, collecting data among another group of Sakai, called the Sakai Jeram, a coastal tribe of mixed racial origin. Subsequently, further comparative data were obtained from the Tamils, Gurkhas, the Ainu of northern Japan, the Bajous or sea-gypsies off the coast of north Borneo, and some negrito people in Luzon, Philippine Islands. Previous to this work the investigator had been given a course of training in the giving of the tests at the Psychological Clinic of the University of Hawaii. The present chapter will embody his results.

The Senoi, or Sakai as they seem to be most usually referred to in anthropological literature, inhabit the mountains at the headwaters of the rivers draining the main Perak Kelantan range in the Malay Peninsula. As they live by hunting and gathering and are extremely primitive, and their culture more nearly approaches that of the Bushmen and Australian aborigines, the chief attention will be paid to them.

Apparently very little anthropological study has been made of these people, although some individuals, mainly in the foothills of the ranges, were measured and described by Martin. In 1902 an anthropological expedition was conducted among these people by W. W. Skeat² from whose writings the following brief account is compiled.

The Sakai are cymotrichous (wavy haired) and dolichocephalic, and were identified by Schmidt with Indo-Chinese

² Skeat, W. W. "The Wild Tribes of the Malay Peninsula." *J. of Roy. Anthropol. Inst.*, Vol. V, 1902.

See also Skeat and Blagden, *Pagan Races of the Malay Peninsula*. Macmillan and Co., London, 1906.

stock, but were classed by Virchow as Dravido-Australians, in which division are placed the Veddas, the Tamils and the Australians. However, if Skeat's description of the Sakai is correct, they are dissimilar in several important respects to the Australians. He says they are short—4 feet 9 inches or 4 feet 10 inches in height—often a light yellowish brown in skin color, with long and pointed chins but faces wide across the cheek bones. The beard "usually consists of a few long and frizzly chin hairs," though in some cases the hair is bushy. Except for their long-headedness and prominent eyeridges, they would seem to be very different from the Australians, who are tall, very dark and extremely hairy. The description would fit the Bushmen of South Africa much more nearly.

Unlike the Australians who live in open forests and plains and the Bushmen who inhabit savannahs and low bushy plains, the Sakai are forest dwellers and depend very largely on the products of the woods. They gather yams, some of which can be eaten only after considerable preparation, as otherwise they are poisonous. The treatment consists of soaking them in swamps or running water and then squeezing the juice out. Another method is to crush them and then cover them with slaked lime.

Besides the fruits of the forest, the Sakai also obtain light crops of sweet potatoes, maize, sugar cane and bananas. All kinds of animals, including monkeys and snakes, are eaten, while big game is also hunted. They are exceedingly expert in hunting and in making traps for wild animals and according to Skeat, their senses are unusually acute.

Their weapon is mainly the blowpipe, though some tribes use also the bow and arrow. The pipe is made of a single segment of a rare kind of bamboo called *Bambusa Wrayi*. This measures from 6 to 8 feet in length and is fitted into

another hollow bamboo of slightly larger diameter. This serves to keep the inner tube from warping. The darts are about the length of a knitting needle, made from the mid-ribs of a certain kind of palm leaf. The point is very sharp and is nicked a little distance from the end so that when the animal goes through the brush the shaft will break off leaving the point in the wound. The other end of the dart has a small conical knob a little smaller than the diameter of the pipe. Around this is packed a little ball of soft fluffy substance obtained from the base of the leaves of the palm. The blowpipe in my possession has a very short segment of bamboo fitted closely around the inner tube of bamboo, which is dark brown and highly polished. This shorter segment has the effect of allowing a slight amount of play of the inner pipe within the outer tube making it very easy to withdraw. If necessary the length of a pipe may be increased by pulling out the inner tube like a telescope. The arrows fit Skeat's description very well except that the "nick" referred to by him is more in the nature of a thinning down of the shaft. Some of the arrows are about an inch shorter than the others and appear to have a lesser portion smeared with the poison. These are evidently used for different kinds of game. This is the modern weapon of the Sakai.

The point of the arrow is thickly smeared with a very deadly poison obtained either from the sap of the famous Upas tree or the juice of the roots of a creeper that is called the Ipoh Akar (*Strychnos* sp.). Sometimes, though it is not necessary, venom from the sacs of poisonous snakes and scorpions is added to the poison which is usually boiled till it reaches the right consistency. Skeat says that the usual range of the blowpipe is thirty yards, but occasionally birds or monkeys will be shot from a distance of sixty yards. It

is not a difficult weapon to use, as with very little practice I have been able to blow one of the darts with sufficient force to stick in a pine wall at a distance of twenty-five yards.

As becomes people who live in the forest, their houses are usually built of leaves. Sometimes a long communal house of bushes is built sufficient to shelter the whole community. If elephants or tigers become dangerous, houses are built twenty to thirty feet from the ground in the trees, access being gained by the use of a ladder.

No weaving is done or pottery is made but mat work and basketry are common. Cloth is made by beating the under bark of a big tree called the Terap (*Artocarpus Kunstleri*), which is a species of wild bread fruit. Girdles and aprons of bark cloth are worn and for ornament armlets of wire, necklaces of monkey teeth, beads, shells, etc., are used, while in some cases a bone is worn through the perforated septum of the nose.

The Sakai have as their northern neighbors negrito tribes who also extend down the coast on each side of the main range, especially to the west of the Peninsula. These negritos near the coast are mixed with other peoples such as the Sakai and one group which Mr. Stewart also visited is called the Sakai Jeram.

Another account of these people has been given by Ivor Evans.⁸ He found that the Sakai proper were by nature timid and reserved. They are firm believers in spirits. Trees which are of a peculiar shape or deformed by creepers are thought to be their abodes. Even manufactured articles such as blowpipes are also thought to possess souls. Their main magic workers are shamans or *halaks*, who are on such famil-

⁸ Evans, Ivor H. N. Some Sakai Beliefs and Customs. *J. of Roy. Anthropol. Inst.*, Vol. XVIII, 1918.

iar terms with the occult that each has his attendant spirit. The halaks avert calamity with their rites, exorcise demons that possess the sick, and can change themselves into were-tigers. Killing by magic is also practised, the method being to place the charmed darts on the palm of the hand and point them in the direction of the enemy.

When a Sakai dies, rice and herbs are planted over his grave for his spirit's sustenance. A tiny, three-cornered house is erected at the end of a long pole for the dead man's soul to inhabit and a ladder is built so that it can come and go at will. Tobacco and betel nut and food are also placed inside for the spirit's comfort. White butterflies are the souls of dead persons.

Thunder and lightning are much dreaded by these forest people and when a very bad storm comes on the people will first throw out of their tree-houses the hot stones upon which the cooking pots rest, and then descend and stick their working knives into the ground. Certain foods such as deer's meat, wild pig and others are forbidden to women. A female must not eat a double banana—if she does she will have twins, one of whom must be killed.

Marriage according to Skeat is based on purchase but is accompanied by a very strange custom. The groom must chase the girl around a mound built in the shape of a truncated cone and if he cannot catch her before she has completed the circuit seven times the marriage is postponed.

According to one of the legends of the Sakai-Jakun, one of the mixed negrito tribes, an old woman named Arud rules the world of spirits. Her house is floored with dead men's ribs and their leg-bones make the roof posts, and she uses their skulls to drink out of. At intervals she suffers a metamorphosis and becomes young again.

Evans found the natives very shy and difficult to deal

with, and formed a rather poor opinion of their mentality. He says:

"In working among the aborigines I have been hampered by several circumstances: firstly the timidity, reticence or stupidity of the tribesmen. . . . It must also be remembered that it is difficult to find a Sakai, who will, or can, fix his attention on any one subject for more than a few minutes at a time; hence, it is necessary, after talking about anything for a little while, to let the matter drop and return to it later. To question an aboriginal, especially a member of one of the wilder tribes, minutely and elaborately, usually only results in the visible distress and confusion of the savage."

To the foregoing accounts of the Sakai, the following additional details are selected from Stewart's notes: ⁴

These mountain folk, according to Noone's estimate, number about 12,000, and are called by him "Senoi," which means fellow—"one of us." Some dry land farming is carried on, men and women sharing in the labor, the former clearing the plot of forest, the latter doing the cultivating. Jungle fruits and plants augment the food supplies and the men hunt and catch fish with nets and traps and by poisoning the water. Everything that is raised for food or obtained by hunting is shared in communistic fashion, although the rights of ownership in personal possessions, such as drums, tools and weapons, are rigidly respected. As previously mentioned, the whole of each local community may be sheltered in a "long house" built conveniently near the communal cultivation plot.

According to Stewart these people remain quite isolated from the outside world. Iron is obtained by barter from the

⁴ Stewart, K., "A Report on Porteus Maze Test Results from Some of the Racial Groups of South Eastern Asia and the Peripheral Islands." An unpublished study.

border tribes and is worked up into knives and arrow points. "Almost everything they use is made of bamboo and it is amazing the number of things they do with it. A half-dozen of them could build us a substantial house of it nearly as quickly as we could pitch a tent. Water containers, cooking pots, musical instruments, blowpipes, and when it was hardened by fire, even spears and knives were made of this magic substance. Together with rattan, this omnipresent plant fulfilled almost all of their needs."

The clothing is still made as was previously described, the men using a bark cloth breech clout, and the women a skirt extending from hip to knee.

In the local groups, everyone is the relative of every one else and has obligations and privileges as a result of that relationship. How much their social organization is the counterpart of the Australian we must await the publication of Mr. Noone's studies to determine. We have for the present the following observation by Stewart:

"When they come together for collective enterprises, such as fish poisoning or warfare, certain men are recognized as leaders, both because of ability and hereditary connections, but arbitrary authority seems always at a low ebb, and good fellowship and coöperation is always in evidence. In fact one cannot help being impressed by the gentleness and sociability of these people. There seems to be almost no competition for power or food among them."

Singing and dancing were very popular Sakai recreations and all took part with such concentration of purpose that a state of half-hypnotic trance was soon induced. The investigator notes that an excellent relationship existed between Noone and the tribespeople; men from "long houses" miles away from the route of the expedition visited the party and participated in dances in his honor. Consequently, they ac-

cepted the examiner as the anthropologist's friend and "co-operated beautifully in the testing program."

In all, three expeditions were made into Sakai country and Maze tests were given to fifty-six adult males from ten to fifteen long houses scattered over a wide area. "They seemed to comprehend the test readily and showed great interest in making a good score. When they asked what it was for they were told it was a white man's game and that I had been brought along to entertain them and they all seemed satisfied with this explanation and apparently got great fun out of playing it. They have a number of puzzles and games of their own which are somewhat comparable to the Maze situation." Unfortunately, no further mention of these games is made so that it is impossible to say how nearly they resemble the test.

From these descriptive notes it is obvious that the test comparisons between the Sakai and the Australians should be extremely interesting. Apart altogether from the Sakai's supposed Australoid affinities—which seem to me to be very doubtful—the two groups are in other ways fairly comparable, the cultural advantages being, however, with the Sakai. The fact that they are familiar with the use of iron, practise agriculture, build themselves houses and make bark clothing would seem to put them more on the cultural level of the Bechuana and similar Bantu tribes rather than on that of the Australians. The average Maze test score of 56 mountain Sakai was 10.43 years, almost exactly the same as that of the aborigines of the northwest of Australia and a little below the level of the Amaxosa in South Africa.

Fortunately we may make comparisons closer home, with a group that is culturally no higher but who have many more opportunities of contact with other peoples than the Senoi. These people are the Sakai Jeram who live in the

foothills and coastal regions of the Malay Peninsula. They belong more in the category of people measured and described by Rudolf Martin and are said to be closely related to the Pre-Dravidian stock with, however, a mixture of Negrito. These Sakai Jeram, despite their contact with Malayan and European culture, did very poorly in the Maze tests, the average performance of 29 adult males being only 8.02 years, very little above the level of the Kalahari Bushmen. I have been told by Mr. Keir, government educational director, that these people number about 30,000 and live a nomadic existence and are culturally very low. They have, he believes, educational possibilities, as a school recently established for them and attended by fifty individuals is showing excellent results. The group thus educated would, of course, represent a highly selected sample.

A surprisingly fine record was made by an immigrant group of Tamils who were brought from Southern India to work on the Malayan plantations. These Tamils represent Dravidian stock and though transported from their homes were living in their own way in their own communities. Illiterate subjects only were chosen and the examiner notes their interest in the tests and their marked superiority both in speed and accuracy. Twenty adult males made the highest score yet recorded for a non-Caucasian group, viz., 13.175 years, which can be but little short of any group of unselected whites.⁵ This would seem to indicate that Maze test performance is not closely related to schooling, evidence which has a most important bearing on the interpretation of the test results.

Another group of immigrant laborers was also examined, in this case 21 Gurkhas, also illiterate, from Nepal. These had

⁵ The examiner comments that their performance on the test was surprising to him "in view of the low opinion which is usually held of their ability and culture in Malay."

been imported to work on tea plantations which are situated in the higher altitudes to which these people are accustomed. The average score of 21 individuals was 11.33 years.

Still another sample of an interesting people was obtained. These were roving sea people who are to be found living along the Sulu Archipelago and the northeast coast of Borneo. They call themselves Bajous, live on small boats, and the Filipinos know them as "sea gypsies." The examiner found them exceedingly shy and suspicious and difficult to get hold of, notwithstanding the fact that he had as guide and interpreter a young man whose family had formerly belonged in their group but had now settled on the land. The only ones who could be persuaded to submit to the tests were young men who had worked on pearling vessels and had had contact with Europeans. The older people disapproved of this participation in an activity that seemed to them fraught with danger, the performance savoring, to their minds, of black magic.

These people were dark brown in color but looked little different from the people of the islands near which they ranged. They lived a most unsettled existence, moving about in their small boats following the fish and avoiding the typhoons, occasionally bartering a stray pearl or other sea products for knives, ropes, etc. Notwithstanding their handicaps, the group did fairly well on the Maze tests, the score of 22 Bajous being 10.61 years.

The performance of the Sakai Jeram provides an interesting parallel with that of another group also reputed to be in part of the same racial stock. These were the negritos of the Zambales Mountains in Luzon, Philippine Islands—illiterate males, but with some contact with civilization. From Stewart's paper I transcribe the following comments, relating to the two negrito or part-negrito groups:

"The blacker and smaller and more kinky-haired the individuals were, the poorer they seemed to be in the tests, both from the standpoint of scores and speed. I give this as an impression which I received while testing in both groups, and it is not reinforced by any exact measurements or by objective rating techniques in the characters mentioned above. Non-negroid characters were noted on each blank, however, and all of these individuals are above the medium scores for the group.

"The two groups, Sakai Jeram and Zambali negritos, from which the tests were obtained, are predominantly negroid and are represented in anthropological literature as being very much alike. They are thought to comprise two of the three existing branches of a pigmy negroid race which at one time was widely distributed throughout the southern part of Asia. The other existing branch comprises the Andaman Islanders. Physically they seem to have reached a high state of evolution in everything but size. They are well built, active, strong little people, and seem to have a great deal of endurance and physical resistance to disease and exposure, as evidenced by the fact that they have existed for millenniums in the territory which people of superior intelligence and culture did not want. Emotionally they seem to exhibit much the same feelings as other branches of the human family. They apparently have the ability to become good craftsmen, judging from their blowpipes and bows and arrows, but they do not seem to have the ability to cope with abstractions to the same extent as their neighbors. In Malaya they have a feathered shaft for their bows but they are apparently unable to understand the principle of windage and clip the feathers so short that they serve as nothing but a decoration. They are expert hunters and have a minute knowledge of jungle plants and animals, but these things are dependent upon mechanical dexterity and memory and not on their ability to think in abstractions."

The average score of the Philippine negritos was better than that of the Sakai Jeram, namely 8.88 as against 8.02 years. So far the Bushmen and the two groups with negrito blood have scored the lowest of any people on the Maze.

In striking contrast to these results is the performance of

some Ainu adults, examined in Hokkaido and Karafuto (Saghalien). It is doubtful, however, whether these can be considered to be pure Ainu, as many of them have adopted Japanese customs and undoubtedly have intermarried with the latter. The investigator quotes Dr. Bachelor, who has lived many years among them, to the effect that there are very few pure Ainu under thirty years of age. Fifty-one adult males scored in the Maze test thirteen years, second only to the Tamil group.

The results with adults are collected into Table VIII. For convenient reference the Bushmen and Australian groups are included.

TABLE VIII
AVERAGE MAZE TEST PERFORMANCE—PRIMITIVE AND
ILLITERATE GROUPS (STEWART'S DATA)

Racial Group	No.	Locality	Maze Average
Tamils	20	S India	13.175 yrs.
Ainu	51	N. Japan	13
Gurkhas	21	Nepal, India	11 33
Bajous	22	Sulu Archipelago	10 61
Karadjeri	19	N W. Australia	10.52
Senoi (Sakai)	56	Perak-Kelantan Mts.	10 43
Negritos	22	Zambali Mts , Luzon	8.88
Sakai Jeram	29	Coastal Districts, Perak	8.02
Bushmen	25	Kalahari, South Africa	7.56

The investigation was completed by the examination of some Formosan children and sundry groups of children and females elsewhere. The Formosan aboriginal adults were not available mainly because Stewart was not allowed in the Formosan villages after dark and in the day time only with

a Japanese guard. The children who were examined were mainly in the Musha school. Their attitude is noted as friendly and coöperative and the note is made that "they seemed to get great fun out of playing this American game." Though the results of examining children and females are not essential to this study, I have included them in Table IX. In order to make the groups as nearly comparable as possible the test quotients are given. The very high standing of the Ainu and Formosan boys should be noted as well as the fact that in this and in every other study with the Maze, the performance of females seems to be consistently lower than that of males.

TABLE IX
MAZE TEST QUOTIENTS. ALL GROUPS

Racial Group	No	Mean	S D.	P E.
Ainu Boys	9	105.9	8.05	1.81
Ainu Girls	17	100.9	19.69	3.22
Formosan Boys	23	101.5	22.7	3.19
Formosan Girls	9	81.3	18.6	4.18
Ainu Adult Males	51	93	15.24	1.44
Ainu Adult Females	16	87	19.77	3.33
Gurkhas (Males)	21	81	19.31	2.84
Bajous	22	26	18.09	2.6
Sakai	56	24.4	19.76	1.78
Negrito Males	27	60	20	2.02
Negrito Females	20	46.3	8.75	1.32
Sakai Jeram	30	54	13.37	1.65

Because so much space has been devoted to the presentation of the Maze test results, it must not be supposed that I am relying too much on the significance of this test as a

measure of intelligence. Apparently, judging by previous criticism, it is necessary, even at the risk of being tiresomely repetitious, to point out that no test or group of tests is to be considered an adequate measure of intelligence in the wide sense that I have defined it. All that the Maze test does is to examine one complex of mental traits and abilities which seem to have a bearing on successful social adjustment. The evidence that racial differences, independent of culture or environmental factors, exist as regards that complex of traits appears to me convincing. It seems extremely difficult to persuade the critic that some sweeping demonstration of the whole matter is not possible, and that the evidence on racial differences must be collected painfully and piecemeal. Fortes,⁹ for example, has complained that no competent psychologist would rely on one test alone to determine intelligence but would require at least a battery of six or eight tests. The answer to this statement is, in the first place, that no competent psychologist has so relied on a single test, and in the second place that it is no easy matter to find tests that meet the requirements for use with primitive peoples. Those that I have found least open to objection are described in the following chapters.

⁹ Fortes (*Man*, April 1932) has delivered himself of some very extraordinary criticisms of my Australian results. My deductions were developed, it seems, "with but little reference to the concepts of modern psychology"—presumably to those that deal with an imaginary "primal horde" or a "racial memory" without any conceivable anatomical basis, the accepted concepts of those who strain at the gnat of mental test comparisons and swallow the psycho-analytical camel. Furthermore, I found too much evidence of aboriginal intelligence in considering native customs and not enough in the results of the tests. Though the tests are rough and inadequate, I should have subjected the data to the most refined statistical treatment, the Kelly-Spearman method of tetrad differences. I have also committed the naïve fallacy of supposing that the Knox Cube Test is a test of visual rote memory and not an intelligence test. For his part Fortes sees a parallel between asking a Western European to repeat Chinese syllables as a rote memory test, with an aboriginal required to repeat polysyllabic place names in his own native tongue!

CHAPTER XVIII

PSYCHOPHYSICAL COMPARISONS

PROBABLY since the days of Cain and Abel people have clung persistently to the idea that each man carried with him, displayed in one or all of his physical characteristics, the sign of his inner nature. Apparently the divinity that was supposed to shape our ends took a malicious delight in betraying us to our fellow men. No matter with what walls of secrecy we surrounded ourselves, nor how carefully we locked ourselves away behind closed doors of reticence and reserve, the key to character had been hung outside. All that was necessary was to find that key and the whole of our inner selves would be open to inspection. In subtle irony the Potter when he fashioned the vessel wrote its future history in hieroglyphics stamped upon the clay. The very lines on our hands were supposed to proclaim our destinies.

The face, being that part of us chosen more particularly for the display of emotions, was examined most hopefully for the indices of character. The eyes have been called the windows of the soul and physiognomy in general was thought to hold unmistakable clues to personality. For a long time it was believed that eyes set narrowly denoted a false or cunning nature, that a high forehead signified great intelligence, that a pronounced development of the back of the head meant philoprogenitiveness or love of children, and that a square jaw went with a determined or courageous nature. Unfortunately, there were so many exceptions that the rules became nullified and all attempts to use physiognomy as the basis of character analysis seem to have failed.

Since the brain is the physical organ of the mind, and the head contains the brain, phrenology attempted to use the various protuberances on the skull as indications of intelligence, with what success everybody knows. Only the untutored or simple-minded now receive such pronouncements with any seriousness, and phrenology is being rapidly relegated to the limbo of forgotten theories.

But if the configuration of the skull furnished no guide to the functioning of the brain beneath it, it seemed much more reasonable to suppose that the size of the brain itself would have something to do with intelligence. Plausibility is lent to this theory through the fact that progress and evolution in the animal kingdom have been accompanied by an increase of brain size. Considering the whole series of organisms from amoeba to man, we may find an undoubted correlation between the relative size of the brain and intelligence. The study of comparative anatomy reveals the many strange shifts to which Nature has been put in order to endow her creatures with larger brains. She has sometimes been in such haste to do this that she has made some grave mistakes in brain building. For example, she made a fatal mistake with the invertebrates when she encouraged them to build their brains around their gullets. The larger the brain became, the smaller grew the oesophagus so that the creature was faced with the dilemma of being intelligent and ill-fed, or remaining unintelligent but still being able to enjoy a good square meal.

But even with such hazards overcome, the development of a cortex or an external rind for the central nervous system created another dilemma, for extent of surface became equally as important as volume. There are limits to the size of the head one can conveniently carry and already a goodly part of its substance and area had been preëmpted for the

special senses of sight, smell and hearing, for speech, mastication and the display of emotion. Hence the demand for increased brain surface could be met only by infolding that surface into fissures and convolutions, or what might better still be known as corrugations. We may sum up the matter by saying that Nature's constant preoccupation has been to give us as large a brain plus as large a surface as she conveniently can.

So important has been this process of brain evolution in size and surface that Nature has run ahead of herself in our case. She has laid the foundation of future development far in advance of man's capacity to build on those foundations. Every human cortex contains many millions of undeveloped neurons or nerve cells. If these were to grow suddenly and send out nerve processes, we should be a race of macrocephalic idiots, suffering from intracranial pressure, for there would be insufficient room inside the skull for such a development. Hence, we have far greater potentialities for brain growth than we can ever avail ourselves of—more brain cells than the human animal can ever use.

From this it may be gathered that there are penalties to disharmonious growth. Perhaps because of this fact, there is not, so far as individuals are concerned, any significant correlation between the size of the brain and intelligence. It is possible that in relation to the difficulty that large headed people have in being born, and other factors of disharmony in bodily development, the bounds of head size have already been phylogenetically set. Despite the fact that progress in evolution has been towards a larger brain, compensatory developments may already be operating so as to make a smaller brain equally effective. In other words, Nature's efforts, though they have been mainly directed towards producing larger brained people, may also be ex-

pended in packing good brains into smaller compass. Danger, of course, lies in the extremes. We may expect to find idiots and imbeciles among both the very small and the very large headed people.

We do not have to guess at this condition. A visit to any feeble-minded institution will provide examples of both macrocephalic and microcephalic cases. Nor are we entirely in the dark as to what occurs outside such institutions. Some years ago Professor Berry of Melbourne University and myself embarked upon an investigation of this subject. After measuring some ten thousand individuals of all ages from six to twenty years and establishing norms of brain size in the living, I chose 200 individuals, all of whom fell within the extremes of head size, and examined them by means of so-called intelligence tests. According to my results, mental deficiency was three and a half times as frequent among the one hundred small headed as among the one hundred large headed, and mental brightness was five times as common among the large headed. In short, some of the big-brained were exceedingly stupid, and some of the small-brained were exceedingly intelligent; yet if the hundred large brained individuals had been pitted as a group against the hundred small brained, they would probably have won in any kind of intellectual competition. The fact that the relationship was a mixed one, macrocephaly and microcephaly both being associated with mental dullness, meant that there could only be a small correlation between size of brain and intelligence.

The most quoted study on this subject is that by Karl Pearson of London who measured lengths and breadths of the heads of some 4500 individuals and correlated the results with a measure of their intelligence. Unfortunately, he did not compare the brain capacity with the scholastic standing but merely the single head diameters. The coefficients were

very small—ranging from .1 to .14—which means that either of these single head diameters is of no value in predicting the intelligence of its owner. However, my own studies show that if the brain capacity is calculated from the three diameters of length, breadth and height the correlation with intelligence rises to between .2 and .3—admittedly a very small coefficient, making the measurements of little or no value as diagnostic aids. However, a relationship of this nature, while it may tell us little or nothing of the individual, may be of some importance as regards the group or the race.

For example, there is only a small correlation between bodily strength and stature, yet because of that relationship the hundred tallest men in a crowd would probably outpull in a tug of war the hundred shortest, notwithstanding the fact that some of the short men would be exceedingly strong and some of the tall men would be exceedingly weak. In the same way, other things being equal, the racial group with the larger brain capacity might be expected to excel a smaller brained group. Unfortunately, other things are not usually equal. Brain capacity also correlates about .3 with stature¹ and so the taller races would have an advantage in brain capacity. Possibly, it may therefore be somewhat unfair to compare the Southern Kalahari Bushmen with the Australians, although on the score of stature the latter are comparable with Europeans.

One of the subsidiary lines of evidence which point towards the significance of brain capacity in the group or race is the fact that the mentally deficient of our own race are rather markedly lower than the average in head size. My demonstration of this fact has, however, been subjected to

¹ Writers often speak of brain size relative to stature and weight as though these latter have a much closer relation to brain capacity. Relative brain size has very little meaning, since it is only in small degree proportionate to body weight and stature.

criticism mainly at the hands of Professor Paterson,² the objections being repeated by Klineberg and Oliver, two writers who discuss racial differences in brain capacity. Paterson complains that I compared the mentally deficient with norms gathered from the socially superior classes, and that the differences found were therefore social differences.

As it happens there was ample justification for making the comparisons as I did. The Vineland Training School, where the study was made, is a privately owned institution, and although it accepts a group of state pupils, the rest are the children of parents who can afford to pay up to \$1,000 per annum for residence and tuition. Hence, these defectives are by no means drawn from the lower social grades of the population. Further, the norms for girls were based largely on results of measurements of state school girls in Victoria and represent a fair sampling, not of the lowest social grades but of the middle class in that Australian state.

However, since Professor Berry and myself collected data from both the preparatory colleges and state schools, it is possible to place the percentile tables side by side and discover just how much difference lies between the medians of the two social classes. Comparing the medians for the two social classes at 7, 9, 10, 11, 12, 13 and 14 years, we find that the average advantage of the groups of better social grade amounts to 27 c.c. of brain capacity at each year.

The brain capacity of 130 feeble-minded, with I.Qs. below 55 and whose average age was 14 years, was 1258 c.c. or 99 c.c. below the average of normal 14 year olds. If we subtract the 27 c.c. to allow for the social difference, the feeble-minded are still 72 c.c. below the normal capacity. This deficiency just about equals the total growth of the brain from

² Paterson, Donald G. *Physique and Intellect*; and Klineberg, Otto. *Race Differences*.

8 to 14 years of age; in other words, this group of feeble-minded was retarded six years in brain development. Thus Klineberg's suggestion that "the lower economic level of the feeble-minded may have been entirely responsible for the difference" is seen to be without foundation. In the first place this group of feeble-minded was not at a lower economic level, and in the second place, if it had been so, the difference between its capacity and the normal average would still have been marked.

In order to answer more adequately Paterson's objections that this "striking deficiency of the feeble-minded is a function of selection," I have taken the records of 520 consecutive cases examined by me at the Vineland Training School from 1919 to 1922 and compared their measurements with the percentiles for the lower social grades. Even with this adjustment, 217 or 41.6% fall below the ten percentile. Of 215 cases below a Binet I.Q. of 55 and probably definitely feeble-minded, 53.4% were below the ten percentile; of 142 cases between 55 and 70 I.Q., 33.8% were similarly below the ten percentile; of the dull normals (above 70 I.Q.) only 26.7% were below this level. Normally, of course, 10 per cent are below the ten percentile.

Hence, not only is it clear that the feeble-minded as a group are markedly below the normal in brain capacity, but also the lower the mental level of the group the more marked the deficiency is. Further, this deficiency is apparent whether the comparisons are made by means of tables of norms for either the upper or lower social grades of the population. So far as these facts have any bearing on the general relationship to intelligence, it would seem that the evidence from the feeble-minded points in the direction of the significance, in the mass, of brain size.

When we turn to the consideration of racial averages in

brain capacity, it must be admitted that the matter is somewhat confused. In the first place we have no reliable scale upon which the various races can be placed as regards their general cultural or mental status. Secondly, the evidence itself is unreliable. Klineberg publishes a table, drawn from many sources, of the skull capacities of various racial groups, the measurements being obtained by plugging the holes in the skull and filling the cavity with water. Anyone who has worked with skulls will recognize how difficult it is to make this measurement with any approach to accuracy. Measurements with sand or seeds are also unsatisfactory, the reading depending largely on how tightly the material is packed in. As is the case with the water filling device, there are all kinds of nooks and crannies in the skull which do not contain brain matter but which take up the sand or water to varying degrees.

How well the openings or foramina of the skull are blocked, how open the sutures are and thus how much water they can absorb, whether the skull is wet or dry are all factors affecting the measurements. When sand is used, the question of its dryness and dampness and how tightly it is tamped in will affect the results considerably. My own experience is that successive measurements of the same skull have given readings as far apart as 140 c.c. It is quite evident that figures on series of skulls measured by different observers with no uniformity of method are practically useless for comparative purposes. The calculation of the capacity by outside measurements is difficult because of the irregularity of the shape of the head, but at least the error is merely due to the formula and not to lack of uniformity in the measurements. Two observers should obtain approximately the same capacity. When in addition to the possible inaccuracies of measurement a table such as Klineberg's

does not give the number of skulls upon which the average is based, the reader is little disposed to pay it serious attention.

The only reasonably accurate method of judging the brain capacity is to remove the brain in a fresh state, *i.e.*, before injection with formalin, tie a string to the brain stem and discover its water displacement. Unfortunately, fresh brains are hard to come by. In a series of forty-five measured in this way by Dr. MacMillan and myself at Melbourne University, the average error of the capacities determined by skull measurements, using Lee's formula No. 14, was 6 per cent of the capacity arrived at by the displacement method. My own experience leads me to the belief that filling with shot gives a much more consistent reading than sand, seeds or water.

As far as our racial figures go, there seems to be some relation between the cultural status, as far as it can be estimated, and the brain capacities of the racial groups. Berry and I found the average of twenty year old University students to be 1483 c.c. Sixty-four Australian aboriginal adults measured by Burston were found to have a brain capacity of 1347 c.c. or 136 c.c. below the white mean. Since the Australians are a rather tall race (average 169 cm.) no allowance need be made in their case for small stature. My own measurements of these people resulted in a somewhat lower average—1328 c.c. for all cases, although the Central Australians average 1353 c.c. and the northwestern group 1323 c.c.

The Bushmen measured by me in Africa fell somewhat below the level of the Australians as a whole, their average being 1317 c.c. In comparison with the Central Australians they are distinctly lower. It should also be remembered that with the Bushmen are included a group of Bushmanoid

Madenassena who are tall and comparatively large headed. The Southern Kalahari Masarwa, who as we have seen are most like the Cape Bushmen, have a distinctly lower average. Eleven of them averaged only 1281 c.c. or 47 c.c. below the Australian average.

TABLE X
BRAIN CAPACITY AVERAGES

Racial Group	No	Average	S D	P E
Bushmen	25	1317	72.8	9.82
Bathonga	32	1321	77.2	9.21
Amxosa	30	1324	53.4	6.58
Mchopi	30	1329	84.7	10.43
Shangaans	28	1333	67.3	8.1
Wakaranga	34	1351	88.7	11.26
Vandau	42	1366	77.7	8.09
All Bantu	196	1339
All Australians	120	1328

The most surprising thing about the results given in Table X is, however, the lowly position of certain of the African Bantu tribes, especially the Bathonga and the Amxosa. Both groups are but little above the Bushmen and below the Australians. However, the numbers are small so that the results may not be representative. Combining all the Bantu together we find that the average capacity of 196 individuals is only 1339,³ but little above the Australians.

The average capacity of Amxosa skulls as measured by Shruballs by the shot method (quoted by Klineberg) was 1570 c.c., a most extraordinary difference from the results

³ Dr H. L. Gordon found the average brain capacity of 1,119 Bantu in East Africa to be 1312 c.c. ("Amentia in the East African.") *The Eugenics Review*, Vol. XXV, No. 4.

obtained by me. The same investigator found the Kafirs to average 1540 c.c. as against my average for Bantu of 1339—just over 200 c.c. of difference. On the other hand, Broca found Hottentots and Bushmen to be 1317, exactly the same capacity of the Bushmen measured by me. The African and Australian results can be compared in Table X.

Measures of Strength

Included in the program of tests and measurements carried out with the Australian aborigines in 1929 was a number of strength tests such as leg and back lift, arm shoulder strength, etc. Unfortunately, the instruments required to take these measurements are bulky and in my Kalahari trip it was necessary to cut down the load as much as possible. In addition to the head measurements, there was one psychophysical test that seemed to offer more information than any other in proportion to the time and trouble expended on applying it to the individual. This was a test of strength of grip.

There were several reasons for retaining this test. In the first place it seemed readily applicable to primitive people. Almost fifty per cent of the central Australians had records of strength of grip in either hand above 50 kilograms, which is a little below the normal white average. One native in the northwest had a right-hand grip of 73, a record very rarely equalled by any white man. From these facts it was evident that the subjects were responding very well to the test, although it was impossible to judge whether they were exerting their best efforts.

The feeble-minded are notably deficient in strength of grip. The Smedley dynamometer, with which the test is made, has a stirrup arrangement which must be squeezed with a maximum of effort. When this is done there is some

discomfort which the defective is unwilling in many cases to undergo. The aborigines' well known tolerance of pain and discomfort is such that this factor need hardly be considered.

Finally it has been shown that the dynamometer tests other things besides strength. Concentration and coördination of effort and determination are involved and these are mental factors. It may be for these reasons that a correlation exists between grip and mental tests. In the case of the feeble-minded, Doll ⁴ found an extraordinarily close correlation with the Binet mental ages—a coefficient of no less than 69 having been obtained. The writer's own experience ⁵ with normal individuals would place the coefficient much lower—the average correlation for boys from 6 to 13 years of age, taken in single age groups, being .26. The correlation between the Maze test and strength of grip in 48 aborigines I found to be .25. This correlation may be due in part to the willingness of the more intelligent subjects to coöperate more fully in the test.

In Tables XI and XII the grips of the different African groups are given and for comparative purposes two groups of Australians are included. It will be seen that the Amaxosa are surprisingly low and that the Central Australians are excelled only by the Mchopi. Of interest may be the following records obtained in Hawaii: Filipinos 45, Japanese 46, Part-Hawaiian 53.5 and Whites 54 kilograms.

These data on grip may have a bearing on some extremely interesting theories as to the reasons for right-hand dominance. The large majority of civilized people are right handed. So general is this characteristic that all kinds of unfavorable associations are made with the use of the left

⁴ Doll, E. A. *Anthropometry as an Aid to Mental Diagnosis* Publications of the Training School, Vineland, N. J., Feb. 1916, p. 47.

⁵ Berry, R. J. A and Porteus, S. D. *Intelligence and Social Valuation*. Vineland, N. J., 1920, p. 54.

hand. According to the Bible the sheep are to be divided from the goats—the saved on the right hand, the damned on the left. We speak of the bar sinister, of left-handed compliments, and take an oath with the right hand uplifted. In short, right has become synonymous with probity and righteousness, and in a world of right-handed people, sinistrals are inconvenienced in some ways and are often brought under pressure to use the right hand.

TABLE XI
STRENGTH OF GRIP—RIGHT HAND

Racial Group	No.	Right Grip	S D	P E
Amaxosa	29	40 24 kg.	6 17	77
Shangaans	26	43.81	6 04	.8
Bushmen	25	44	9 6	1.3
Wakaranga	29	46 14	6 64	83
N. W. Australians.	53	46 23	7.48	69
Central Australians	39	47	8 52	84
Mchopi	28	47 25	5 37	.68

TABLE XII
STRENGTH OF GRIP—LEFT HAND

Racial Group	No.	Left Grip	S D.	P.E.
Amaxosa	29	38 86 kg.	5.27	.66
Bushmen	25	41.64	9.07	1.21
N. W. Australians	53	44.66	8 09	.75
Shangaans	26	44.85	4.48	.59
Central Australians	39	45.36	7 77	.84
Mchopi	29	47.52	7.29	.91
Wakaranga	29	47.6	6.4	.8

It is interesting to speculate how this right-hand preference became engrained in the human physique so that with handedness also goes cerebral and eye dominance. There are many theories, all of which are discussed exhaustively by Wile ⁶ in a recent book.

He seems to favor one of the many explanations of this phenomenon. This theory supposes that primitive man, regarding the sun with special reverence and interest, had a tendency to orientate himself towards it and describe its course with a right-handed movement from left to right. Magical and religious importance became attached to this hand which thus became socially preferred. Related to this theory also is the idea that the rotation of the earth has a deflective influence on objects on its surface. Wile says: "Since the force of the earth's rotation is ever eastward, although directionally to the right in the northern hemisphere and to the left in the southern hemisphere, the dominance of righthandedness might suggest that the origin of man was in the northern hemisphere." The implication is that the swing of the earth's movement has made us lopsided.

How this deflective influence should result in righthandedness is not clear, since man moves also by his own volition and faces all points of the compass, changing his direction with the activity of the moment. The theory requires, however, that lefthandedness should be more common in the southern hemisphere and whether it be due to the earth's rotation or not, that seems to be a fact. Table XIII gives in percentages the incidence of right- and left-hand dominance in strength of grip for our groups. It should be remembered, however, that greater strength in the left hand does not necessarily mean that that hand is preferred for skilled move-

⁶ Wile, Ira S. *Handedness: Right and Left*. Lothrop, Lee and Shepard Co., Boston, 1934.

ments, though it would seem natural to suppose that the hand which is used more often should have the greater strength. I have included in the table several groups measured in Hawaii.

TABLE XIII
RIGHT- OR LEFT-HAND DOMINANCE IN GRIP

No	Racial Group	Right Stronger	Racial Group	Left Stronger
77	Part-Hawainans	79.2%	Wakaranga	65.5%
35	Whites	77.1	Shangaans	57.1
86	Japanese	76.7	Mchopi	39.3
52	Chinese	75.0	Amaxosa	34.5
25	Bushmen	68.0	Australians	34.3
62	Filipinos (Ilocanos)	64.1	Filipinos	20.3
29	Amaxosa	62.1	Bushmen	24.1
99	Australians	54.5	Chinese	21.2
28	Mchopi	53.6	Whites	17.1
28	Shangaans	35.7	Japanese	14.0
29	Wakaranga	31.0	Part-Hawaiians	13.0

The group of whites included in this table is small, but Wile (p. 64) quotes Hitchcock's report on the arm strength of 312 students, 78.25% of whom were stronger in the right hand as against 13.7% in the left, results practically identical with my own.

The five racial groups of Table XIII who have more than one-third of their number stronger in the left hand belong in the southern hemisphere, the Bushmen alone being the exception to this distribution. Primitiveness also does not seem to be the deciding factor.

The extraordinary amount of left-hand dominance among

the African Bantu tribes should be noted. Wile has already commented on this tendency. "I cannot say offhand," he writes, "to what the greater prevalence of lefthanders was due. It may merely represent a greater prevalence of native sinistrality among Africans who are nearer the natural biological levels. It is noteworthy, however, that in books of ethnology, travel and archaeology, I have noted the greater frequency of lefthanders among the pictured Africans." My results seem to confirm this observation, and open up an interesting field of investigation regarding this racial difference. In view of the theory of the building of Zimbabwe by the Wakaranga, it might be worth while to look for evidence of left-handedness in these ruins.

Among the Zulus the use of the left hand was considered so unlucky that a child who used that hand predominantly was punished most severely. Accordingly to Kidd's account, "the people pour boiling water into a hole in the earth and place the child's left hand in the hole, ramming the earth down round it; by this means the left hand becomes so scalded that the child is bound to use the right hand." ⁷ It is noteworthy that the Amaxosa have a smaller percentage of left-hand dominance than the other three Bantu groups, the Wakaranga, Shangaans and Mchopi. Nevertheless, sinistrality must be quite common among them.

According to Wilson, primitive artists tend to make drawings of persons looking to the left rather than to the right. Of one hundred Australian aboriginal children's drawings, 75% look to the left, 3% to the right and 22% are drawn full face; 89% of the African children's drawings look to the left, 10% to the right and 1% are full face. Of 80 Japanese, 15% look to the left, 2.5% to the right and 82.5% are full face. Seventy per cent of white children's drawings and

⁷ Kidd, Dudley. *Savage Childhood*, p. 296.

57.7% of Chinese are drawn full face. Apparently Wilson is correct as regards the primitive artist's tendency but there is no foundation for his statement that a right-handed draftsman "almost certainly made his figures look to the right." Apparently very few individuals, whether right-handed or left-, draw a single figure looking to the right.

CHAPTER XIX

TESTS OF LEARNING CAPACITY

EVERY investigator who has attempted to give mental examinations to primitive folk has soon recognized the special difficulties inherent in the situation. It is impossible to eliminate from the results all shadow of environmental influence. Not only is it a fact that no test material is equally familiar to all racial groups, but even when that material is reduced to a minimum of complexity, there may be the influence of a certain "cultural set" which affects performance. This is particularly the case in tests scored on speed of reaction. As previously mentioned, many primitive peoples are decidedly averse to hurrying.

Then, too, there is the problem of adequate geographic samplings of the race. My own experience in Australia shows that there is a difference in the results according to whether the subjects were examined in the center of the continent or in the northwest. In the case of peoples living under the most primitive conditions, it is a difficult problem to get a sufficient number of subjects from *any* area. The old recipe for jugged hare began, "First catch your hare"; the racial investigator must first find his Bushman or aboriginal, then examine him.

Undoubtedly the greatest difficulty is the one first mentioned—the diminishing of the effects of environment on the test results. Nissen, Machover, and Kinder, who carried out a study of negro children in French Guinea, West Africa, offer this comment in relation to programs of racial testing:

"The sheer accumulation of test scores, then, whether or not they consistently point in the same direction, must leave us with two essentially inseparable variables, viz., race and environment. The test which will eliminate or measure the effect of either element alone has not been devised, nor can we accept speculation as a substitute for the scientific differentiation of these two factors."¹

It might be observed, in reply to this statement, that in individual testing we are also faced with the impossibility of eliminating the environmental variable, but no one proposes to give up individual testing on that account. Where the environmental disadvantage is obvious, we discard the tests that are most susceptible to this influence, and then make due allowance for the disability by lowering the standard of performance. In the same way, the racial student will choose only tests that are least affected by environment. For example, tests dependent on language would be the first to be eliminated. In the next place, no experienced investigator would choose a performance test that uses material entirely unfamiliar to the native subjects. In this connection it is odd to note that Nissen, Machover and Kinder used the Ship Test. In this test a picture of a ship mounted on wood is cut into ten rectangular pieces, the problem being to reconstruct the picture. This task was given to the subjects despite the fact, as the authors remark, "the children probably had never before seen either so complicated an example of pictorial art or any ships, perhaps not even canoes." What these investigators expected to discover by the application of such a test is beyond comprehension.

As indicating the gap between social adaptation and test performance, they instance the case of a French Guinea

¹ Nissen, H. W., Machover, S., and Kinder, Elaine F. "A Study of Performance Tests Given to a Group of Native African Children," *Brit. J. of Psychology*, Jan. 1935.

native who lived seven years in New York and yet by the tests classified as a mental defective. "Yet," they remark, "he gave every evidence of having made a more than satisfactory social and economic adjustment to white civilization, which was marred only by his having bitten off part of the ear of his opponent in an altercation." In Hawaii we have several scores of Filipinos in prison, whose adjustment to civilization is marred only by having stabbed their opponents in altercations.

In my opinion it is unnecessary to discard the tests simply because we can make no exact scientific differentiation of the racial and environmental factors. The best criterion of freedom from environmental load is the interest the subjects evince in the test. Despite the fact that the authors found the Guinea natives "averse from mental exertion" and that their unhurried lives were "unmarked by any absorbing curiosity or interest in anything extraneous to their normal pursuits," they remark of the Maze test: "Considerably more time was needed for this test than for any other in our series, and it was also the test on which our subjects seemed to work hardest." It is no product of "speculation" to say that environmental influence in such a test must be of minimum importance.

It is for this reason that special stress has been laid in earlier chapters on the results of the Maze test. The tests which are reasonably applicable to primitives are so few in number. To the inexperienced in anthropological work it might seem an easy matter to devise tests that will fit into the familiar cultural background of such people. It is not difficult to devise tests of this kind, but to have them mean much in relation to intelligence is a different matter.

Psychologists have not been wholly oblivious to the problem, and various attempts have been made to incorporate

in tests material which would be fairly familiar to all peoples. One such series used among other things line drawings of things supposedly universally known, but the supposition proved ill-founded. For example, to some peoples the representation of the setting sun as a semicircle with lines radiating out to denote the beams of light is perfectly intelligible; to others it is an unrecognizable convention.

No one is more alive than the present writer to the danger of making too sweeping comparisons of native races on the basis of a single test series such as the Maze. I have, therefore, searched diligently and experimented widely in the hope of finding more reasonably applicable tests. One alternative to using test material that is familiar is to choose a test the material of which is so simple that it will be readily understood and manipulated even by savages. Such a test is the Goddard Form Board, in which the task is to place variously shaped wooden blocks into corresponding spaces in a board. The material is so simple that performances can be differentiated only by scoring the test on speed, and this, as we have seen, is a disadvantage if the natives are compared with whites. However, the test may be useful in comparing native groups among themselves. The fairness of this procedure rests on the observation that most primitives are careful and deliberate in their approach to any problem and therefore tend to be almost equally handicapped on the test.

In order to provide some practice, three trials are given in this test, the score being the best time of the three trials. Table XIV gives the results for the various African groups, the Australian records being interpolated so as to make comparisons possible.

Here again it should be noted that the Bushmen are at the bottom of the list. In *The Psychology of a Primitive*

People I ventured the suggestion that the results of this test might be considered an index in part of native adaptability to the tempo of civilized behavior. If this is so, then the Bushmen are more inadaptable than the Australians and the latter are inferior to some of the African groups.

TABLE XIV
GODDARD FORM BOARD TIMES

Racial Group	No	Seconds	S.D.	P E.
Vandau	44	16 86	3.68	.37
Bathonga	33	17.27	2 82	.33
Wakaranga	33	18.53	2 42	.28
Shangaans	30	19 63	4 18	.51
Amaxosa	25	20 03	6.35	.79
Mchopi	30	21.1	6.53	.8
Central Australians	39	21 2	6.81	.73
NW Australians	29	24 86	7 87	.98
Bushmen	24	28.58	9 27	1.28

The Form and Assembling Test is another test which is scored on speed but in which success depends not only on visual discrimination but on planning and mental alertness. It is less dependent on manual dexterity than the Goddard Form Board. The test consists in first matching twenty-three pictures of parts of a hammer, wheelbarrow, knife, coffee pot and chair and then assembling these parts as belonging to these objects. These articles are familiar enough to natives who have had any contacts with civilization. Some of the Bushmen tested, however, had so few of these contacts that some at least of the objects were strange to them. The test was tried out with them and finally discarded. Because of the planning required in the test, it is perhaps not surprising

to find that the Australians excel several of the African tribal groups, notably the Mchopi and Shangaans. Results are set forth in Table XV, the scores being given in terms of mental age by this test.

TABLE XV
FORM AND ASSEMBLING TEST

Racial Group	No.	Test Age	S D	P E Av
Bathonga	32	10 03	2.59	.31
Central Australians	31	9 65	3 11	.37
Amazosa	19	9 47	2 49	.39
N W Australians	46	8 67	2 34	.23
Wakaranga	24	8 46	1 93	.27
Mchopi	21	7 67	2 4	.35
Shangaans	20	7 55	1 59	.24

A test which was especially devised for Australian aboriginals was the Footprints Test. The feats of tracking accomplished by bush natives are almost unbelievable. It is no unusual thing for them to trail with comparative ease a bare footed man over hard ground where only the keenest scrutiny will reveal the slightest disturbance of the dust or grass. Their skill is such that some of them can recognize the footprints of individuals in the camp to which they belong. Not only human footprints but the marks left by everything that moves are correctly observed and interpreted. The women are also good at tracking small game, and a favorite amusement is for them to portray in the dust by means of pressure of fingers and hands the tracks made by each of the wild animals, the representations being carefully observed by the older people. Any slight inaccuracy is hailed with great derision.

Accordingly, in order to make this interest in tracks the basis of a test, I asked eight aboriginal males at Beagle Bay to walk over a dusty section of ground and then took photographs of the different footprints. These were printed in duplicate sets and the task was then to match twenty of these duplicates with the original pictures. The photograph is, of course, not the same as the actual footprint, and at first in the Kalahari it was difficult to get the Bushmen to recognize what the photographs represented. Once the similarity to actual footprints was pointed out they became quite interested, and in several cases immensely amused at the correspondence.

In spite of the Australians' skill in tracking, their performance was excelled by several of the African tribal groups, while the Bushmen, who also are noted trackers, were at the bottom of the list. The test is therefore not to be interpreted as an actual trial of tracking skill but merely as one of care and exactitude in comparing photos of material more familiar to natives than to whites.

TABLE XVI
FOOTPRINTS TEST

Racial Group	No	Score ¹	S.D.	P.E.
Mchopi	30	16.57	3.10	.38
Shangaans	29	16.55	2.37	.3
Bathonga	33	16.39	2.52	.37
Vandau	44	15.73	3.14	.32
Central Australians	38	15.47	3.07	.34
Amxosa	29	15.	4.2	.53
Bushmen	23	14.04	3.4	.48

¹ Score is the average number correctly matched.

Apparently this test is one in which cultural advantages are of little weight, since two groups of "raw" natives head the list. The average performance of white students, fourteen years in average age, was found to be 15.57, about the same as the Australian aborigines. The African subjects would, however, average about five years older than the whites. It is impossible to say how whites of equal age would have compared with the natives. In view of the relatively good performance of the primitive groups, it is unfortunate that tests of a wider intellectual reference than the matching of footprints could not be devised, using material similarly familiar to natives. It is the only performance test I know of in which there is a practical equivalence of scores as between civilized and uncivilized groups. However, seeing that footprints are more familiar to the natives, we might expect them to excel the whites far more than they do.

Performance tests, as they are called, deal in the main with the ability to manipulate things, to match colors or forms, to deal with what might be called practical tasks involving the use of concrete material. As such they provide only an indirect method of approaching the problem of estimating potential learning capacity. Yet wherever natives are under the political domination of whites, attempts are made to give them formal education, either in their own language or that of the dominant race. Whatever the language used, the education given is in content essentially western or European. The racial group that cannot avail itself of this schooling is just as handicapped as the individual of inferior learning capacity. Hence, it is desirable to measure, if possible, the learning capacity of the native groups in a more direct way than by performance tests.

Memorizing ability is, of course, a very important factor in school learning, but as is well known varies according to

the material and the mode of presentation. Some people can remember figures better than words and others find reproduction easier, according to whether they hear the material, read it, or write it down. Logical memory, or memory for related material, such as the ideas or items of a connected story, is usually well developed in the savage. Various observers have remarked on the excellent ability of natives to reproduce myths, legends or stories after hearing them once or twice, and from this have inferred, quite mistakenly, that these natives have good all-round memory ability.

It is easy to overlook the fact that the recitation of such stories and myths constitutes almost the sole intellectual exercise of primitives. Because of this narrow range of interest, all that falls within that range is, as it were, in the spotlight of attention. What is learned is learned well. Among defectives and young children this so-called logical memory is often well developed. They will recite with extreme fidelity of reproduction lengthy stories, provided that the content is within their range of interest. That adult primitives display a similar ability is no real proof that they have good all-round memories.

The possession of a good logical memory is quite consistent with having a very inferior rote memory for unrelated material. This immediate memory for unrelated material is of considerable importance, particularly in those early stages of formal education in which the individual must learn to combine the symbols or abstractions that form the basis of reading, spelling and arithmetic. For example, many words in English must be spelled almost entirely by rote memory, the sounds being but little guide to the spelling. Then with regard to proficiency in addition, subtraction, multiplication and division, memory bonds must be quickly formed so that the various number facts and combinations

are, as it were, at the tip of one's tongue. There is no way of remembering that seven nines make sixty-three except by learning it by repetition, and the person with a good rote memory has decided advantages in the way of acquiring such facts.

Because of the importance of rote memory in the school learning situation, defective individuals who are notoriously weak in this capacity have a particularly difficult time in mastering the elements of spelling, reading and number work. Long division is a fatal stumbling block for most defectives because the number facts or combinations that must be held in mind are too numerous. Once the initial hurdles in these school subjects are got over, a good rote memory becomes of less importance. The child who has a five digit span in rote memory—i.e., can repeat five numerals in order after one hearing—is much better equipped for school progress than one who possesses only a four digit span; but the difference between a person who can repeat eight as against one who can remember nine numerals is of little importance.

Contrary to popular belief, "easy come, easy go" has no application to memory. The child who learns fast does not forget quickly, the advantages of retention being usually with the ready learner. The child with a poor rote memory not only requires more repetitions of the matter to be learned, but as a general rule forgets more readily. School progress in such a case is extremely slow.

According to the standardization of the Binet test, the normal child of five can repeat four digits given once (*e.g.*, 4-9-3-5) in at least once out of three different samples. The seven-year-old child repeats five, the ten-year-old six, and the fourteen year old seven digits in order. A normal adult range is between seven and eight digits.

In order to make comparisons with primitives, I have recently compared the rote memory abilities of defectives,

Australian aborigines and South African natives. The defectives had all been examined at the Psychological Clinic of the University of Hawaii and consisted of 350 cases of Japanese, Chinese, Portuguese and part-Hawaiian blood. The aborigines to the number of 110 had almost all had some contact with a mission and in every case were familiar with the names of the English numerals; 108 Africans of various tribes (not Bushmen) were also tested. The distribution of ranges of ability is given in percentages in Table XVII.

TABLE XVII
AUDITORY ROTE MEMORY

Memory Span	Bantu (N 108)	Defectives (N 350)	Australians (N 110)
7 digits	4.6%	1.4%	0
6 "	20.4	18	4.5%
5 "	50	32.5	18
4 "	20.4	35.7	40
3 "	4.6	12.3	37

From the figures given in this table it is clear that Mission school students in South Africa, though considerably below the white average, are very markedly in advance of Australian aborigines and that these latter do not equal the record of a group of mental defectives of mixed racial origins in Hawaii. My own experience is that individuals who possess less than a five digit span are incapable of profiting by school instruction except to a very limited extent. Even allowing for the possibility that the Australian aborigines' unfamiliarity with the test situation may have militated against them to the extent of reducing their memory span by one digit—a very generous assumption—there would still be 37% with very limited capacities for formal education.

Table XVIII gives the average span of three African tribal groups and two groups of Australians. The score is also given in terms of mental ages by norms established in Hawaii. The relatively low scores of the Bantu tribes are surprising. In their case neither unfamiliarity with the test material nor lack of schooling can be advanced as an explanation of these inferior records. Their relatively poor performance seems to indicate a real racial difference.

TABLE XVIII
AUDITORY ROTE MEMORY

No of Cases	Racial Group	Digit Span	Mental Age Score
32	Bathonga	5.34	8.53 yrs
42	Vandau	4.93	7.45
34	Wakaranga	4.82	7.29
41	Central Australians	3.93	5.63
57	N.W. Australians	3.77	5.14

It may be objected that there is some element of unfairness in presenting a memory test in terms which are not as familiar to the subjects as corresponding names of numbers in their own language. To obviate this possible criticism, a rote memory test with visual presentation was used. A simple xylophone with four bars was constructed. These bars are tapped in a certain order by the examiner and the subject is required to imitate. The sequences were the same as the Knox Cube Test which Nissen, Machover and Kinder found particularly applicable to negro children in French Guinea. The sequences at first are extremely simple and increase rather rapidly in complexity.

Before presenting the results of this test, it should be mentioned that the tribes of Portuguese East Africa are familiar with a musical instrument of the xylophone type called the Mchopi piano. At the mine compounds in Johannesburg, on certain Sunday mornings, the native mine laborers are encouraged to put on tribal displays of dancing, etc. At the City Deep compound we were fortunate to see one of these dances, the music for which was provided by a band of Mchopi musicians using these "pianos." These players were so skilful that they were able to reproduce popular tunes with great accuracy and spirit besides playing their own tribal airs. If, then, there is any advantage in familiarity with the test material, it should rest with the Mchopi. This tribe, however, placed only fourth in order of performance. The improved visual rote memory over the auditory rote memory is somewhat marked, especially in the Central Australians who approach much more nearly the records of the African Bantu tribes. As usual the Bushmen are at the bottom of the list.

TABLE XIX
VISUAL ROTE MEMORY—XYLOPHONE TEST

Racial Group	No.	Mental Age	S.D.	P.E.
Vandau	44	9.32 yrs.	3.27	.33
Amxosa	30	8.95	1.88	.23
Wakaranga	33	8.61	2.75	.32
Mchopi	30	8.57	2.62	.32
Shangaans	30	8.57	3.58	.44
Central Australians	40	8.35		
Bathonga	32	7.91	1.64	.20
N.W. Australians	60	7.31		
Bushmen	22	6.11	1.49	.22

An apparent drawback to the acceptance of the results of testing primitive peoples is that the tests applied have been single and discrete, of varying relations to intelligence and incapable of being collected into a scale. The development during the last five years of a scale of tests by Mr. R. G. Leiter, research assistant at the Psychological Clinic of the University of Hawaii, seemed to offer particular promise as regards applicability to native races.

The special advantage of this scale is that its tests can be applied entirely independently of language. No instructions are required and no pantomime except for a sign for the subject to begin the test after the necessary demonstration has been given. The test material consists mainly of pictures or drawings mounted on blocks which must be placed correctly in notches in a frame to accord with a set of pictures or drawings printed on a cardboard strip attached to the frame.

Different kinds of tasks are set for the subject, the nature of which should be self-evident. Pictures are to be completed, forms matched by color or shape, various analogies are to be worked out. For example, in one test five pictures of African females of different ages from infancy to old age are printed on the cardboard strip, the problem being to arrange in similar age gradation five photographs of males mounted on blocks which are slipped into the appropriate notches in the frame. To make this test applicable in Africa, Mr. Leiter at my suggestion used photos of Hottentots. He also adapted two other tests that I devised for use in Australia, the Footprints Test and a Dot Estimation Test. In another test the series of animals that were to be matched according to habits was also modified by me so as to include animals familiar to African natives. The whole series is described and pictured in a recent publication of the Psycho-

logical Clinic of the University of Hawaii.² Unfortunately, the scale was not available at the time of my visit to Australia, and so far results with aborigines are lacking.

The following tests used in South Africa represent what might be called a Brief Scale. The Footprints Test was left out because I used it as a separate test. Under ordinary circumstances, it should replace the Cube Counting Test, as that depends very directly on school training.

BRIEF SCALE—LEITER PERFORMANCE SCALE

1. Year VI Matching Colored Forms
2. Year VII Matching Two-Color Circles
3. Year VII (Alternative) Arranging Squares by Size
4. Year VIII Series Completion 1
5. Year VIII (Alternative) Analogy Test—Matching Animals
6. Year IX Series Completion 2
7. Year X Recognition of Age Differences
8. Year XI Matching Forms
9. Year XII Line Completion Test
10. Adult Counting Concealed Cubes
11. Adult Dot Estimation
12. Adult Opposites Test

In using this scale one year of mental age is allotted for success in each test up to and including that for Year XII, with the proviso that credit can be given for either but not both tests for years VII and VIII, where alternative tests are provided. For each adult test passed, $1\frac{1}{2}$ years' credit is allowed. Theoretically, by passing all the tests in the scale, a subject could earn $16\frac{1}{2}$ years in mental age score. As a matter of fact, only one individual obtained credit in test number 12 (Opposites) and this should be therefore dropped from the series, making the total score 15 years.

² Leiter, R. G. *The Leiter International Performance Scale with Appendix by S. D. Porteus*. Research Publication No. 13, University of Hawaii.

The conditions of testing and the results obtained in Africa are more fully discussed by me in an appendix to Mr. Leiter's publication. Unfortunately, the scale was not found applicable to the Bushmen, who did not seem able to grasp the nature of the test. I was, however, able to use it with a few Bakalaghadi living in close association with the Bushmen. These also knew no English, showing that the Bushmen's failure to understand the test was not due wholly to language disabilities. I did, however, apply the tests to some Bantu groups and the results are given because of their bearing on the question of racial differences in general.

Leiter standardized this test by applying it to 719 Chinese and 711 Japanese in eleven age groups from six to sixteen years of age, the numbers being approximately equal at each year. The Japanese at each age level exceeded the performance of the Chinese, the differences in mental age scores ranging from 6 to 12 months, the average difference for each year being 8.63 months. This result provides another proof of the reality of differences in mentality between the races and confirms the findings of every other performance test applied to these racial groups in Hawaii.³

Apparently there is nothing that the environmentalist can bring forward that will explain away this difference in performance. The advantage of length of residence of the group in Hawaii lies with the Chinese, they are just as facile in the use of English, are rather less bilingual than the Japanese, and occupy a somewhat better social and economic position in the Territory. Finally, they attend the same schools and have, as far as I know, the same "cultural set" towards mental tests as the other racial group.

The African results with the Brief Scale are given in

³ It should be noted that the Chinese show a slight superiority over the Japanese in "literary" or verbal tests.

Table XX. With regard to these findings, I have already commented as follows:

"Any difference in score between mission and 'raw' natives can be ascribed to two factors, one, a selection of mission natives by intelligence, and two, the effect of mission education upon the test score. Some selection by intelligence undoubtedly occurs, as the mission schools do not retain in their classes the very dull or mentally retarded, while the brighter pupils receive a fuller and more extended training. The degree of influence of education on the test score is difficult to assess. Considering the nature of the tests, it would seem that the effect of schooling would lie in the direction of improving the mental 'set' or attitude of subjects to intellectual tasks in general so that there is less emotional disturbance or nervousness when they are faced with the test. It is hard to see how education in such subjects as arithmetic, English, geography, etc. would affect the performance in tests such as are included in the Leiter Scale. Be that as it may, the cumulative effects of selection by intelligence and schooling appear to amount to about one year's difference in test performance. The actual difference between the scores of the compound and mission natives amounts to 1.14 years.

"Comparing the results of African natives with those obtained in Hawaii, we can say that their average performance is about equal to that of eleven-year-old Chinese and Japanese boys. About 45 per cent of the mission natives scored 11 years or over, 21.5 per cent scored 12 years or over, and about 10 per cent 13 years or over. These last 10 per cent would then be about equal to the average Japanese or Chinese youth in Hawaii. Twenty-five Chinese and Japanese fourteen-year-old boys scored by the Leiter Brief Scale 13 years 6 months.

"The correlation of this performance test with the Binet is 79; probably above that of any other performance test. Hence, it comes more nearly being capable of use as a substitute for the Binet than any other non-language test."

From the results the reader may draw certain conclusions with regard to the comparative educability of South African

natives. The only large-scale investigation of the intelligence of children in South Africa with which I can compare my results is an excellently planned study of native, colored, and East Indian children, carried out by Dr. M. L. Fick,⁴ psychologist to the Union Government of South Africa.

Dr. Fick's conclusion, based on the application of a group of performance tests (including the Knox Cube Test, Porteus Maze, Worcester Form Boards, Malherbe Match Test), was that "at least 70-75 per cent of the native children under consideration cannot complete the primary school course of European standard."

TABLE XX

LEITER BRIEF SCALE APPLIED TO MISSION AND COMPOUND NATIVES

MISSION					COMPOUND				
No.	Tribe	Average	S D	P.E.	No.	Tribe	Average	S.D.	P.E.
33	Wakaranga	10.03	2 11	.248	30	Mchopi	9 32	1.33	.163
42	Ndau	10 14	1 87	.195	30	Amaxosa	9 25	1.9	.233
32	Bathonga	10 97	1 5	.179	30	Shangaans	9 07	1 53	.188
Average of 107 cases					Average of 90 cases				
10 35					9 21				

My own experience would lead me to the belief that a score of 11 years in the Leiter Scale would mark a level of intelligence sufficient to complete the primary course of instruction. At this rate 55.5% of the cases I examined could not be expected to complete such a course with credit. About ten per cent should be capable of higher or secondary education. This is a somewhat more liberal estimate than that made by Fick, who suggests four to five per cent capable of higher education. Incidentally, it is interesting to note that

⁴ Fick, M. L. "Educability of Native Children of the Transvaal Compared with Other Groups on the Basis of Intelligence Tests." Education Fellowship Conference, July 1934.

in his results 10.66% of the natives, 14.9% of the colored group, and 20.8% of the East Indians exceeded the white median in the Porteus Maze Test. For the Knox Cube Test, the figures were Native 13%, Colored 20%, and Indians 37%.

SUMMARY AND CONCLUSIONS

MANKIND in general is a most heterogeneous and variegated mass. Within the one family differences in physique or appearance are often marked; within one race the dark and the fair, the blue and brown eyed, the tall and the short, the straight and the curly haired, the long and broad headed, make up a most bewildering jumble. Whatever plans Nature may have had to erect separate species under the genus homo (self-styled "sapiens"), they must have been scrambled long ago. It is odd to observe, also, that miscegenation is most condemned among the most miscegenated.

Nevertheless, in the welter of humanity, geographical and cultural isolation have resulted in the segregation of groups of people for whom inbreeding plus various factors of natural selection has established a common physical type. Certain features are so generally distributed that a large proportion of individuals may be distinguished from members of other groups. This happens even in nations of allied blood, who live in close proximity to each other, such as the Japanese and Chinese. Skin color is, of course, one of the commonest distinguishing marks, but there are others equally important. For example, a very large percentage of Australian aborigines would be readily distinguished from African negroes, even though both are black. To these large groupings of mankind, whose members can be thus recognized, the word "race" is applied, although the term does not imply purity of blood.

We are on more difficult ground when we attempt to establish mental differences between the various races. There

is so much overlapping in mental traits that these latter can never take their place with such things as skin color or hair texture as criteria of race. Nevertheless, there is no good reason for denying that races differ among themselves in the same way that individuals differ. In other words, we may expect to find group differences in mentality, since races are merely aggregations of individuals. Heredity will surely affect mental as well as physical characteristics. As a matter of fact, even those who think that race is a factor of diminishing importance, would hardly affirm that Bushmen, Negritos and Australian aborigines do not differ mentally from the white race and from each other.

When we come to the question of the scientific measurement of these differences, the "race levellers" permit themselves to be very scornful of its amount and significance. Some go so far as to say that no real evidence of racial differences in mentality has yet been presented. Because of the difficulties in the way of collecting and marshalling that evidence, the question of race differences is a most difficult one to tackle. It is not a matter of studying one race, but of gathering comparative data. As a matter of fact, it is much easier to be critical than to present new or opposing evidence.

The chief difficulty is that environment has some influence upon all of a man's reactions—whether it be the crimes he commits, the benefactions he makes or his mental test responses. Hence, whether we are comparing individuals or races, it is hard to distinguish the two factors of nature and nurture. This does not mean, however, that we should give up the task but rather should direct our attention towards choosing tests or controlling the test situation in such a way that environmental influences will be held at a minimum.

A rather extreme view with regard to the mentality of

racess is that repressive or unfavorable environments are such severe handicaps to development that any observed differences are entirely fortuitous. Cultural advantages, educational and otherwise, are also often invoked as environmental factors in seeming neglect of the fact that these are man-made and that originally when all mankind was at the lowest stage of culture the only advantage possessed by a group, other than that of superior mentality, was the advantage of a more fortunate location.

If this theory be tenable, then it should be of great importance to attempt to compare the effect of physical environment on such primitive races as exist today. Given two racial groups, living in two distinct environments, one of which is more repressive than the other, then we should expect to find the more unfavorable circumstances reflected in the average intelligence of the two races. If on the other hand the two environments are equally repressive, and we can demonstrate differences in development, then it is clear that these differences are due to inequalities of mental equipment.

The set-up of the problem therefore requires in the first place two races, sufficiently primitive so that their achievements can be fairly comprehensively studied; in the second place we need a study of their respective habitats; and thirdly a comparison of their levels of intelligence, interpreting this term in a wide sense so as to include not only mastery and use of environment but also social adaptations, imaginative skills, industry and art, and general educability.

For my present purpose, I have chosen for study the Bushmen of South Africa and the aborigines of Central Australia. This present volume is concerned with a comparison of advantages as regards each race's habitat, and by means of the mental test approach, social adaptability and edu-

cability. The latter phase of the problem is important because these primitive races must adapt themselves to a changing world, or go under.

As regards two groupings of the same race living in different environments, the effect of this difference in mentality has already been studied. The northwestern area of the continent of Australia lies within the region of regular monsoonal rainfall, and though not favorable for white population, provides constant and ample food supplies for the aborigines. In the dry season the game collects about the permanent water, but due to the fact that the natives rigidly respect their tribal hunting boundaries, these places are not depleted by wholesale slaughter and in the wet season serve as dispersal points for the re-stocking of the country.

Central Australia, on the other hand, presents an entirely different set of conditions, the ever-recurring and long-continued droughts, necessitating at such times a most precarious hand-to-mouth existence for its inhabitants. The location of every spring and waterhole must be known to the old men, and under their direction the horde must break up into family groups and scatter about the country in order to maintain a miserable living.

Nevertheless, despite the more unfavorable environment, the Central Australians were, in almost all the tests applied, superior in development to their more fortunate neighbors of the northwest.

As regards the Bushmen, their habitat presents in many respects a striking contrast to that of the Central Australians. Because the Australian physical environment has already been described in detail, considerable attention has been devoted to presenting a picture of that little-known region, the Kalahari, and its people. From the narrative of our visit to this so-called desert, it is hoped that the reader

may get a clearer and more intimate view of the Bushmen in their natural setting.

From the standpoint of our study, the remarkable profusion of game, even in the Southern Kalahari, is a most significant feature. Though surface water is almost absent, the presence of the tsama melon makes possible the sustenance of life for both man and beast. The peculiar conditions are reflected in the habits of life of the Kalahari people, Baka-laghadi and Bushmen, the former sedentary, living in dire poverty but in permanent villages, the latter nomadic, restless, disorganized, but carefree. The sparsity of springs and permanent waterholes might explain the loosely knit social life of the Bushmen, who are without chiefs or tribal cohesion, were it not for the fact that we find in the same area a group who have attached themselves to the soil and have established themselves in kraals and villages, under a definite, well stabilized system of chiefs and headmen.

The northern Kalahari, because of the annual overflow of the Okovango and the Chobe rivers, presents a more favorable area for human habitation. Game of every kind is even more plentiful than in the south, and includes the elephant, rhino, hippo, giraffe, eland, roan and sable antelope, lechwe and tsessebe. The only drawback to the existence of hunting and collecting tribes in this area is the presence of malaria and possibly sleeping sickness, together with conditions of closer competition with other tribes.

From the comparisons given, it is clear that the Kalahari, with its more reliable rainfall, its herds of game, its tsama melons and other forms of veldkos or vegetable food, is far more habitable than the Australian steppes. The terrifying droughts, the emptiness of the land, the poverty of its food resources mark Central Australia down as one of the most inhospitable areas outside of Arctic and Antarctic regions.

For the white man the weariness and loneliness of life in the Kalahari are undoubted, but these handicaps are psychological rather than physical, and for the Bushmen have a greatly diminished weight.

What then of the mental characteristics of the native inhabitants of the two areas in question? As far as I can see, the Bushmen, in point of achievement, may be considered to have excelled the native Australians on two counts only. As regards resistance to encroachment on their domain, the South African race offered a more determined and courageous, though in the long run a no more successful resistance to the white invaders. But this must not be attributed to a more closely knit tribal structure, under which their resources could be better mobilized for defence, but to two entirely different sets of circumstances. In the first place, the South African terrain—the home of the Cape Bushmen—with its rugged ranges, its kloofs, krantzes and mountain caverns, formed an ideal fighting ground for the men of the wilderness, and for this we can find no parallel in Australia. Here again was an environmental advantage. The second and equally important factor was also environmental, but had marked psychological effects. The Bushmen, having to contend not only with some of the most dangerous wild animals on earth, but also with some of the fiercest native tribes, were inured to peril and accustomed to warfare. On the other hand, venomous snakes constitute the only lethal danger in the Australian bush, and the natives there suffered no competition from other peoples. These factors are not mentioned, however, to detract from the fact that the palm for physical courage goes to the Bushmen.

The other high point reached by the South African aborigines was in the development of artistic skill as shown by the paintings and rock engravings which are found scattered

throughout their country. The Australians also felt the same urge towards pictorial representation but nowhere approximated the Bushmen's skill.

As regards specific mental tests, the Central Australians made quite remarkable records in the Maze test, which can be considered in part a measure of the planning and foresight that would be valuable in social adaptations. The present writer thinks that he can distinguish many special adaptations to their peculiar conditions in the life and customs of the Australians. The general performance of the Australians in the Maze is about 11 years, while that of the Bushmen is between 7 and 8 years or almost 4 years lower. Incidentally, some mission groups of Bantu of various tribes scored about 11½ years, the scores of the "raw" or uneducated natives of Portuguese East Africa being 2 years below that level.

In order to add value to the comparisons of the results from this test, data from various primitive groups in Asia were included. The mountain Sakai or Senoi, an almost unvisited tribe of the Malay Peninsula who live mainly by hunting and gathering, together with a little crude agriculture, were also examined. Though below the level of the Australians, they were distinctly in advance of the Sakai Jeram who live in the foothills and along the coast and who have many more contacts with other more highly civilized peoples than the Senoi or mountain people. The Sakai Jeram, who are culturally very low, scored only a half year in advance of the Bushmen. On the other hand, the Tamils of Southern India and the Ainu of Northern Japan made excellent average scores in the Maze. They were the only two native groups who excelled the Central Australians.

Certain psychophysical measurements were selected from among those applied to Australians and used with the South

African natives. In brain capacity the Bushmen were the lowest of all the groups measured, the average of the Southern Kalahari Masarwa being only 1281 c.c. or 47 c.c. below the general average of the Australians, and no less than 82 c.c. below the Central Australians. Even allowing for the differences in stature between the two groups, the advantage of the aborigines is undoubted. Such evidence as the writer has been able to gather points to the conclusion that, in the mass, increased brain capacity is an advantage. The average brain capacity of the Bantu tribes was 1339 c.c.; this was 26 c.c. above the measurement (1313 c.c.) found by Gordon and Vint for 1119 Bantu in East Africa.

An interesting situation was brought to light by the application of tests for strength of grip. Two African tribes, the Wakaranga and the Shangaans, showed a larger percentage of individuals stronger in the left hand than in the right. African children's drawings are also distinguished by the high percentage of human figures that are drawn looking to the left, whereas white and oriental children in Hawaii tend to draw their figures full face. As regards absolute strength of grip, the Bushmen were at the bottom of the list, considerably below the Australians.

In various tests, which, taken together, may be considered as supplying a measure of school learning capacity, the Vandau, a tribe of mixed Zulu blood living in Southern Rhodesia on the Portuguese East African border, were first in the Goddard Form Board and in the Visual Rote Memory test, second in the Auditory Rote Memory and in the Leiter Performance Scale, and fourth in the Footprints Test. The Bathonga in the Northern Transvaal were first in the Form and Assembling Test, in Auditory Rote Memory and the Leiter Scale, second in the Goddard Form Board, third in the Matching Footprints, and seventh in Auditory Rote

Memory. The third group of mission natives, the Waka-ranga, scored four third places and one fifth.

The Australians' record in these tests of learning capacity is lower than that of the mission natives but in some instances is above that of so-called raw natives belonging to various Bantu tribes. Their records were second in the Form and Assembling, fourth in the Auditory Rote Memory, fifth in the Footprints, sixth in Visual Rote Memory, and seventh in the Goddard Form Board Tests. If points were allotted in proportion to position as in an athletic meet, then in the four tests applied to all groups the Amaxosa would score 16, the Mchopi 15, the Shangaans 14, and the Central Australians 12 points. The Bushmen occupy last place in all the tests that were applied to them and would have held a similar lowly position in the tests that were inapplicable. In spite of any environmental advantages they are by no means as educable as the Australian aborigines. The latter are distinctly superior in planning ability and this, I believe, is reflected in their social organization. In imaginative skill the advantage is on the side of the Bushmen, while in mastery and use of environment the two races are adjudged to be on a par.

Other fields of enquiry proper to our study include the comparative levels of material culture, the social organization, and the art and music of the two races. The discussion of these aspects of intelligent behavior must, however, be reserved for another volume.

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